AD-A089 460 URBAN RESEARCH AND DEVELOPMENT CORP BETHLEHEM PA F/G 13/2
RECREATION CARRYING CAPACITY FACTS AND CONSIDERATIONS. REPORT 1--ETC(U)
JUL 80 DACW39-78-C-0096

UNCLASSIFIED WES-MP-R-80-1-1 NL

1 OF 2
AD A 089460

RECREATION RESEARCH PROGRAM

RRP

RECREATION CARRYING CAPACITY FACTS AND CONSIDERATIONS

Report 1

BARKLEY LOCK AND DAM

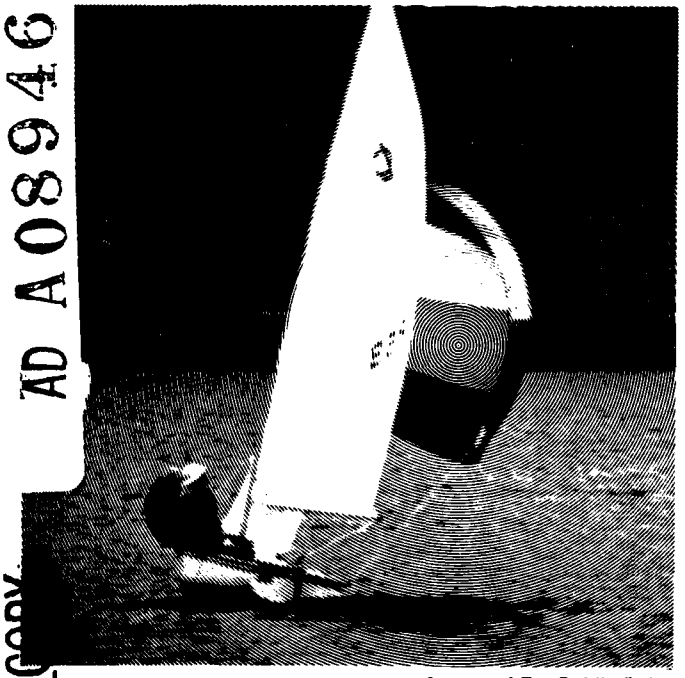
LAKE BARKLEY PROJECT AREA

by

Urban Research and Development Corporation
528 North New Street
Bethlehem, Pa. 18018

LEVEL II

MISCELLANEOUS PAPER R-80-1 JULY 1980 REPORT 1 OF A SERIES



Prepared for

Office, Chief of Engineers, U. S. Army
Washington, D. C. 20314

Under

Contract No. DACW39-78-C-0096

Monitored by

Environmental Laboratory
U. S. Army Engineer Waterways Experiment Station
P. O. Box 631, Vicksburg, Miss. 39180

MISCELLANEOUS PAPER R-80-1

RECREATION CARRYING CAPACITY FACTS AND CONSIDERATIONS

Title	Date
Report 1: Barkley Lock and Dam, Lake Barkley Project Area	Jul 1980
Report 2: Benbrook Lake Project Area	Jul 1980
Report 3: Hartwell Lake Project Area	Jul 1980
Report 4: Lake Ouachita Project Area	Jul 1980
Report 5: Lake Shelbyville Project Area	Jul 1980
Report 6: McNary Lock and Dam, Lake Wallula Project Area	Jul 1980
Report 7: Milford Lake Project Area	Jul 1980
Report 8: New Hogan Lake Project Area	Jul 1980
Report 9: Shenango River Lake Project Area	Jul 1980
Report 10: Somerville Lake Project Area	Jul 1980
Report 11: Surry Mountain Lake Project Area	Jul 1980

Acknowledgements

We gratefully acknowledge the enthusiasm and excellent cooperation of the resource managers, rangers, and other Corps personnel at Lake Barkley and the representatives from the Nashville District Office. Their contributions of practical experience and knowledge, along with their assistance in arranging schedules, have made this carrying capacity research effort possible.

DISCLAIMER NOTICE

THIS DOCUMENT IS BEST QUALITY PRACTICABLE. THE COPY FURNISHED TO DTIC CONTAINED A SIGNIFICANT NUMBER OF PAGES WHICH DO NOT REPRODUCE LEGIBLY.

(18 WES)

(9 Miscellaneous Paper)

Unclassified

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER (19 MP- Miscellaneous Paper R-80-1)	2. GOVT ACCESSION NO. AD-A089 460	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle) (6) RECREATION CARRYING CAPACITY FACTS AND CONSIDERATIONS, Report 1, BARKLEY LOCK AND DAM, LAKE BARKLEY PROJECT AREA,		5. TYPE OF REPORT & PERIOD COVERED Report 1 of a series 6. PERFORMING ORG. REPORT NUMBER
7. AUTHOR(s)		8. CONTRACT OR GRANT NUMBER(s) (15) Contract No. DACW39-78-C-0096 (New)
9. PERFORMING ORGANIZATION NAME AND ADDRESS Urban Research and Development Corporation, 528 North New Street, Bethlehem, Pa. 18018 (New)		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS Recreation Research Program
11. CONTROLLING OFFICE NAME AND ADDRESS (11) Office, Chief of Engineers, U. S. Army, Washington, D. C. 20314		12. REPORT DATE July 1980 13. NUMBER OF PAGES 96
14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office) U. S. Army Engineer Waterways Experiment Station, Environmental Laboratory, P. O. Box 631, Vicksburg, Miss. 39180		15. SECURITY CLASS. (of this report) Unclassified 15a. DECLASSIFICATION/DOWNGRADING SCHEDULE

16. DISTRIBUTION STATEMENT (of this Report)

Approved for public release; distribution unlimited. (12) 72

17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)

18. SUPPLEMENTARY NOTES

A project map of Lake Barkley is enclosed in an envelope attached inside the back cover of this report.

19. KEY WORDS (Continue on reverse side if necessary and identify by block number)

Barkley Lake Project	Recreation	Utilization
Carrying capacity	Recreation resource planning	
Monitoring	Recreational areas	
Overcrowding	Recreational facilities	

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

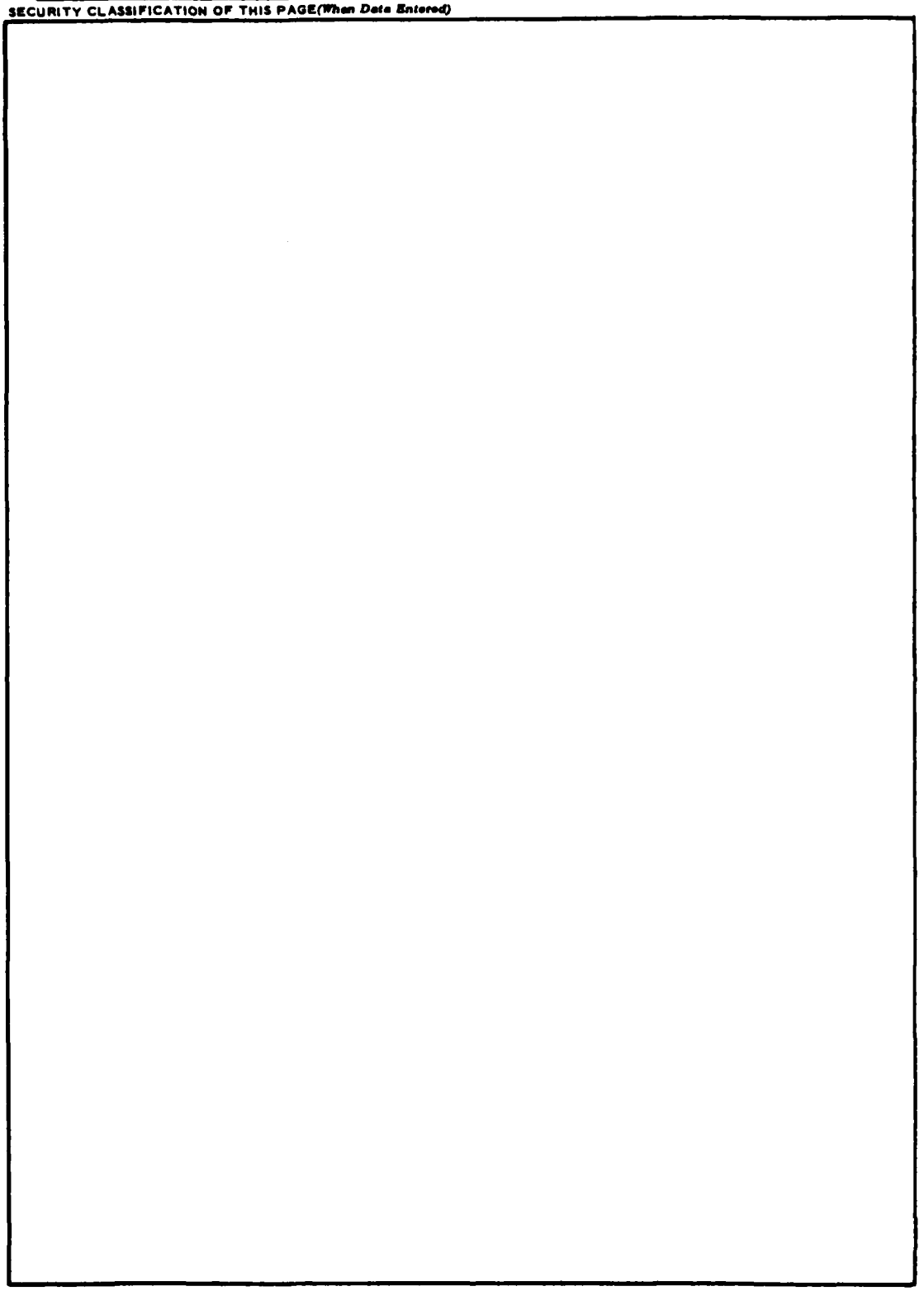
This report provides selected recreation carrying capacity-related information for the Lake Barkley Project. The information is based upon: 1) user and management surveys conducted at Lake Barkley, and Urban Research and Development Corporation's observations and perceptions of the situations at the project's activity areas. The report provides information regarding activity situations, user characteristics, carrying capacity findings, and other findings; it then focuses on selected problem situations and their possible solutions.

DD FORM 1 JAN 73 1473 EDITION OF 1 NOV 65 IS OBSOLETE

Unclassified

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

411 149



PREFACE

This report presents the findings and recommendations of the Urban Research and Development Corporation (URDC) relative to recreational carrying capacity at the Barkley Lock and Dam, Lake Barkley Project Area. Results of site analyses and user surveys are presented as they relate to existing carrying capacity conditions on the project. The study was conducted under Contract with the U. S. Army Engineer Waterways Experiment Station (WES), Vicksburg, Mississippi, (Contract No. DACW39-78-C-0096).

Mr. Donald R. Detwiler, President of URDC, was Principal-In-Charge of this study, assisted by Mr. Martin C. Gilchrist, Executive Vice-President and Mr. David H. Humphrey, Vice-President. Mr. B. Thomas Palmer, Project Director, had the major responsibility for technical project direction; Messrs. Phillip D. Hunsberger and Paul L. Sabrosky were involved in the site analysis, conducting surveys, and the success analysis; and Mr. Timothy A. Fluck was involved in conducting surveys, survey analysis, and development of methodologies.

Mr. R. Scott Jackson, WES was the Project Monitor. Dr. Adolph Anderson, WES, was Program Manager of the Environmental Laboratory (EL) Recreation Research Program. The study was supervised by Dr. Conrad J. Kirby, Chief, Environmental Resources Division, EL, under the general supervision of Dr. John Harrison, Chief, EL.

COL John L. Cannon, CE, and COL Nelson P. Conover, CE were Commanders and Directors of WES during this study. Technical Director was Mr. F. R. Brown.

CONTENTS

CONVERSION FACTORS, U. S. CUSTOMARY TO METRIC (SI)
UNITS OF MEASUREMENT

U. S. customary units of measurement used in this report can be converted to metric (SI) units as follows:

Multiply	By	To Obtain
acres	4046.856	square metres
Fahrenheit degrees	5/9	Celsuis degrees or Kelvins
feet	0.3048	metres
horsepower (550 foot and pounds per second)	745.6999	watts
inches	2.54	centimetres
miles per hour (U. S. statute)	1.609344	kilometres per hour
miles (U. S. statute)	1.609344	kilometres
square feet	0.09290304	square metres
yards	0.9144	metres

* To obtain Celsius (C) temperature readings from Fahrenheit (F) readings, use the following formula: C = (5/9) (F - 32). To obtain Kelvin (K) readings, use K = (5/9) (F - 32) + 273.15.

PART 1: INTRODUCTION

RECREATION CARRYING CAPACITY FACTS AND CONSIDERATIONS

BARKLEY LOCK AND DAM, LAKE BARKLEY PROJECT AREA

PART 1: INTRODUCTION

This Report

Purpose

This report, prepared as the first in a series of the U. S. Army Engineer Waterways Experiment Station's (WES) Recreational Carrying Capacity Design and Management Study reports, provides selected carrying capacity-related information for the Lake Barkley Project Area which cannot be found in the Technical Report. The information is based upon: 1) the user and management surveys conducted at Lake Barkley, and 2) Urban Research and Development Corporation's (URDC) observations and perceptions of the situations at the project's study activity areas. Some observations and suggestions dealing with project area planning, design, and/or management are included, even though they are not specifically carrying capacity related. The report also suggests specific solutions and treatments of specific recreation activity areas.

The report first provides information regarding activity situations, user characteristics, carrying capacity findings, and other findings; it then focuses on selected problem situations and their possible solutions. Although suggestions regarding possible solutions to problems are included, this report is not intended to be a substitute for master planning or to provide answers to all project area capacity problems. Instead, this report should be viewed as a constructive, informative document which points out directions and techniques for consideration by project managers and designers in the near or distant future.

Relationship to Technical Report and Handbook

In addition to this Project Area Report and similar reports on the other ten study project areas,* the overall capacity study effort produced a Technical Report and a Capacity Handbook:

a. The Technical Report describes the overall study process, reports detailed study findings, and suggests and demonstrates methods and techniques for capacity management.

b. The Capacity Handbook is a more graphic, "how-to-do-it" type of report, designed to serve as a useful field tool for determining carrying capacity and applying techniques for capacity design and management.

This project area report is different from the Technical Report and Handbook in several ways: it includes information not found in the Technical Report and Capacity Handbook; it reports and examines user survey information by activity area and project area, rather than from the total survey population; it addresses specific problems and examines possible solutions; and it does not include the methodologies for determining and monitoring social and resource capacity. For these reasons, this report is intended to compliment the Technical Report and the Handbook, and is not intended to substitute for them.

Qualifications

The information in this report is based on the Management/Site Survey conducted on November 15-17, 1978 and the User Survey conducted on July 6-9, 1979 by Urban Research and Development Corporation (see Appendix B). The user survey information was collected over a one-weekend period, which may or may not have been representative of a typical or heavy use weekend at Barkley. Interviews were limited at some activity areas because of such factors as lack of users and weather conditions. For these reasons and because carrying capacity analysis is dynamic rather than static, this report is not intended to provide the final answers. Rather, it is a foundation for future analysis and carrying capacity progress.

---

* See definition of "Study Project Area" in Appendix A for a listing of these project areas.

Summary Project Area Description*

Barkley Lock and Dam** provides flood control, navigation, and hydroelectric power. It is located in a rural area, with Paducah, Kentucky twenty-five miles§ to the west, Nashville, Tennessee about 100 miles to the southeast, and St. Louis, Missouri about 150 miles to the northwest. Lake Barkley has the largest total project acreage of the survey projects (108,600 acres), the largest normal pool area (57,920 acres), and the longest shoreline (1004 miles). Lake Barkley extends 118 river miles upstream, varying in width from 1/2 to 2-1/2 miles. The topography of the surrounding land varies from gently rolling hills causing a moderately steep shoreline to steep hills causing low bluffs along the shore. The vegetation in the project area also varies: grazing pastures, hayfields, herbaceous and woody plants, and a variety of forested areas exist. In summer the temperature is in the upper 80's (degrees F), while the average annual precipitation is 44 inches of rain and 12 inches of snow.

The project is accessible to both local and regional traffic by a well dispersed system of federal, state, and county highways. A variety of recreation environments exist, with areas ranging from underused to heavily used, well developed with many facilities and services to less developed and close proximity to the lake to far away. The 1978 visitation was 5,395,900 recreation days.

---

* Appendix C contains a more detailed project area description for your future use.

** See map inside back cover.

§ A table of factors for converting U. S. customary units of measurement to metric (SI) units is found on page iv.

PART 2: SURVEY FINDINGS BY ACTIVITY

BOATING AND WATERSKIING

Orientation

Boating and waterskiing are popular at Lake Barkley. However, they are limited by the generally shallow depths and, in some parts, submerged objects. Much of the boating activity takes place near the dam, in the many coves, and around the recreation areas (particularly the Canal Area). There are many Corps-operated boat launching ramps on the lake. Other ramps may be found at the seven marinas located in the project area, some of the TVA recreation areas, and other public and private access points.

The remaining findings of this section are based on the User Survey. This survey obtained 7 responses from boaters and waterskiers at Barkley.

User characteristics

Table 1 indicates the characteristics of the boaters and waterskiers surveyed at Lake Barkley. The most significant differences in the characteristics of these recreation sites from those of other study project areas are: 1) the higher incidence of nine or more people in a group; 2) shorter typical trip durations; 3) the very high number of respondents engaged in five to nine activities, but none in less than four; and 4) an absence of sailboaters.

Table 1

Boater and Waterskier Characteristics

Age	Percent of Boaters/Waterskiers	Group Size	Percent of Boaters/Waterskiers
<18	0	1	0
18 - 25	14**	2	0**
26 - 40	43	3 - 4	57
41 - 55	29	5 - 8	14
56 - 65	14*	9 - 12	14*
>65	0	>12	14*

Travel Time to Project Area	Percent of Boaters/Waterskiers	Visit Duration	Percent of Boaters/Waterskiers
<15 minutes	0	1 - 4 hours	0**
15 - 30 minutes	14**	5 - 8 hours	0**
30 - 60 minutes	43*	1 day	0
1 - 2 hours	14	2 days	0
2 - 3 hours	14	3 days	0
3 - 5 hours	14	4 days	14*
>5 hours	0	5 - 7 days	43*
		>7 days	43*

No. of Other Activities	Percent of Boaters/Waterskiers	Equipment	Percent of Boaters/Waterskiers
0	0**	Power Boat	
1	0**	(<25 h.p.)	.16
2	0**	Power Boat	
3	0	(>25 h.p.)	84
4	29	Sailboats	0**
5	43*	Canoe or Rowboat	0**
6	14*		
>6	14*		

*Significantly higher than total survey sample.
**Significantly lower than total survey sample.

User opinions

Spacing preferences - Tables 2 and 3 indicate the spacing that the boaters and waterskiers surveyed at Barkley and elsewhere prefer.

Table 2

Preferred Distance Responses*

Sample	Sample Size	Range	Mean	Median	Mode
All Boaters Surveyed	135	30- a	531	300	300
Lake Barkley	5	75-300	205	200	300
All Waterskiers Surveyed	95	30- a	520	300	300
Lake Barkley	2	300	300	300	300

*In feet; see Appendix A for definitions of terms.

a - response of "alone" or "out of sight."

Table 3

Preferred Distance Responses in Planning Range and Preference Groupings*

Sample	% in Planning Range[1] (100'-1500')	% in A[2] (100'-199')	% in B[2] (200'-450')	% in C[2] (451'-1500')
All Boaters Surveyed	79%	29%	37%	34%
Lake Barkley	80	25	75	0
Sample	**% in Planning Range[1] (100'-1500')**	**% in A[2] (100'-199')**	**% in B[2] (200'-400')**	**% in C[2] (401'-1500')**
All Waterskiers Surveyed	91%	22%	50%	28%
Lake Barkley	100	0	100	0

*See Appendix A for definitions of terms; see Technical Report for a full development of spacing preference information.

[1]Percentage of all preferred distance responses.

[2]Percentage of all preferred distance responses in the Planning Range.

The variations in the spacing preferences of the boaters and waterskiers surveyed at Barkley from those at the study project areas is due most likely to the small sample sizes at Barkley.

Reasons for pleasant/unpleasant experience - Table 4 indicates the impact that different factors had on making the boating and waterskiing experience pleasant or unpleasant for users at Barkley. All respondents found the behavior of other users, scenic views, maintenance, enforcement of rules, and condition of grass or soil to be pleasant. Excess noise and incidents of theft anf vandalism made the stay unpleasant for about a third of the respondents. No respondent indicated that conditions were so unpleasant that he would not return.

Table 5 indicates the changes in the physical condition of the area reported by boaters and waterskiers from their previous visit. No changes in people's use of the area were reported.

Table 5

Positive and Negative Changes Noticed in the Physical Conditions of the Areas - Items Mentioned by Boaters and Waterskiers

Area	Positive Changes	Negative Changes
Lake and adjacent areas	"Higher water" (1) "New campsites" (1)	(None mentioned)

NOTE: The number in parenthesis (#) indicates the number of times the change was mentioned.

Table 4

Reasons Making Recreation Experience Pleasant or Unpleasant--Boating/Waterskiing
Lake Barkley

Reasons	Percentage* of Users Responding:		
	Pleasant	Unpleasant	Not Important
General Reasons			
Characteristics and behavior of other people	100	-	-
Distance from other people	86	14	-
Number of people in other visitor groups	86	14	-
Number and type of other activities occurring here	86	14	-
Scenic views	100	-	-
Noise	71	29	-
Accidents or near accidents	57	14	-
Enforcement of rules/regulations	100	-	-
Car parking facilities	86	14	-
Theft	71	29	-
Vandalism	71	29	-
Land-Based Reasons			
Amount of facilities (restrooms, water, etc.)	86	-	14
Convenience to facilities (restrooms, water, etc.)	86	-	14
Maintenance of facilities	100	-	-
Condition of trees and landscape	71	-	-
Condition of grass or soil	100	-	-
Water-Based Reasons			
Water quality	86	14	-
Formal designation of places for your activity	43	-	14
Waiting time to launch boat	71	-	-
People in areas they shouldn't be	71	-	14

*Percentages may not total 100% because of those responding "Does Not Apply."

Acceptability of techniques - Table 6 indicates the acceptability of different techniques for solving problems to the boaters and water-skiers surveyed at Barkley. The acceptability of techniques is very clear: at least 60 percent of the respondents agreed on one of the three levels of acceptability for 10 of the 17 techniques. However, even for those techniques which were acceptable to most respondents, up to 43 percent responded that these techniques were unacceptable. Thus, project managers should expect some expression of opposition to any technique which they employ.

In general, the more apparent and widespread that a problem of overcrowding or overuse is, the more likely users may accept a technique which addresses it. Thus, remedial techniques (which solve existing problems) are generally more acceptable than preventative techniques (which correct a problem before it becomes readily apparent).

The more users can understand the rationale and operation of a technique, the more likely they will accept the use of the technique. Education, therefore, would seem to be an important method of improving user acceptance of different techniques.

It also seems as though the more directly a technique impacts only the problem, and the less it operates to diminish recreational opportunities generally, the more likely users will accept the use of the technique. Thus, techniques which can be applied in the short-term or selectively to problem areas are favored (particularly if done in a crisis setting).

Techniques which call for reductions in existing opportunities to use recreational resources and facilities are strongly disfavored. User expectations of the opportunities available are critical in this determination. Consideration should be given initially to avoiding overdeveloping an area with the idea that selective cutbacks in services and facilities can be accomplished later. Users expectations will be based on the initial level, and subsequent reductions will be disfavored.

Table 6

User Acceptability of Techniques--Boating/Waterskiing
Lake Barkley

Techniques	Levels of Acceptability Percentage* of Users Responding:		
	Very Acceptable	Mildly Acceptable	Unacceptable
General Planning Techniques			
Keep major recreation areas more separated	43	43	14
Make vehicle access to areas less convenient	14	-	86
Make area's existence less obvious	14	14	72
Site Planning Techniques			
Design for greater distance between people	71	-	-
Reduce number of parking spaces	43	-	57
Management Techniques			
Procedures:			
Require prior reservations	14	43	43
Require permits	43	-	57
Charge/increase fees	29	14	57
Rules and Regulations:			
Impose more rules	43	-	57
Provide stricter enforcement of rules	71	14	14
Close areas when natural resource destruction reaches critical point	71	-	-
Close areas when they become "too full"	71	14	14
Reduce number of activities in same area	57	14	29
Keep unnecessary vehicles out	71	14	-
Services:			
Provide more and better information	100	-	-
Increase maintenance and restoration	71	-	-
Reduce facilities and services	14	71	-

*Percentages may not total 100% because of those responding "Does Not Apply."

BOAT FISHING

Orientation

Boat fishing is popular on the lake and in the tailwater area. The many boat launching ramps make for easy access to the lake from all parts of the project area.

The findings reported in the remainder of this section are based on the User Survey. This survey obtained 17 responses from boat fishermen at Lake Barkley.

User characteristics

Table 7 indicates the characteristics of the boat fishermen surveyed at Lake Barkley. The most significant difference in the characteristics of the boat fishermen at Lake Barkley from those of other study project areas is more of the boat fishermen were at the lake only to fish and few participated in other activities.

Table 7

Boat Fisherman Characteristics

Age	Percent of Boat Fishermen	Group Size	Percent of Boat Fishermen
<18	12	1	6
18 - 25	6	2	24
26 - 40	29	3 - 4	53
41 - 55	35	5 - 8	17
56 - 65	6	9 - 12	0
>65	12	>12	0

Travel Time to Project Area	Percent of Boat Fishermen	Visit Duration	Percent of Boat Fishermen
<15 minutes	0	1 - 4 hours	29
15 - 30 minutes	18	5 - 8 hours	18
30 - 60 minutes	41	1 day	0
1 - 2 hours	35	2 days	29
2 - 3 hours	0	3 days	6
3 - 5 hours	6	4 days	6
>5 hours	0	5 - 7 days	6
		>7 days	6

No. of Other Activities	Percent of Boat Fishermen	Equipment	Percent of Boat Fishermen
0	59*	Power Boat	
1	6**	(<25 h.p.)	33
2	6**	Power Boat	
3	6**	(>25 h.p.)	66
4	0		
5	12		
6	6		
>6	6		

*Significantly higher than total survey sample.
**Significantly lower than total survey sample.

User opinions

Spacing preferences - Tables 8 and 9 indicate the spacing that the boat fishermen surveyed at Lake Barkley and elsewhere prefer.

Table 8

Preferred Distance Responses*

Sample	Sample Size	Range	Mean	Median	Mode
All Boat Fishermen Surveyed	111	30 - 5280	555	200	100
Lake Barkley	17	60 - 5280	1890	300,2000	5300

*In feet; See Appendix A for definitions of terms.

Table 9

Preferred Distance Responses in Planning Range and Preference Groupings*

Sample	% in Planning Range[1] (50'-1500')	% in A[2] (50'-199')	% in B[2] (200'-599')	% in C[2] (600'-1500')
All Boat Fishermen Surveyed	91%	49%	27%	24%
Lake Barkley	50	57	43	0

*See Appendix A for definitions of terms; See Technical Report for a full development of spacing preference information.

[1]Percentage of all preferred distance responses

[2]Percentage of all preferred distance responses in Planning Range.

A significantly high percentage (50%) of boat fishermen expressed a preference for spacing in excess of 1500 feet. All of the responses within the Planning Range were in the closer distance groupings.

Reasons for pleasant/unpleasant experience - Table 10 indicates the impact that different factors had on making the boat fishing experience pleasant or unpleasant for users at Lake Barkley. Only the number of people in other visitor groups and people in areas they shouldn't be were unpleasant in a significant number of cases. None of the respondents indicated that they would not return.

Tables 11 and 12 indicate the changes in the physical condition and people's use of the area as reported by boat fishermen from their previous visit.

Table 11

Positive and Negative Changes Noticed in the Physical Conditions of the Area - Items Mentioned by Boat Fishermen

Area	Positive Changes		Negative Changes	
Lake and Adjacent Areas	"Improved sites"	(2)	"No fish"	(1)
	"Better maintenance"	(1)	"More boats"	(2)
	"Improved & better facilities"	(1)		
	"Added ramp"	(2)		
	"Higher water"	(1)		
	"Bigger fish"	(1)		

NOTE: The number in parenthesis (#) indicates the number of times the change was mentioned.

Table 12

Positive and Negative Changes Noticed in the People's Use of the Area - Items Mentioned by Boat Fishermen

Area	Positive Changes		Negative Changes	
Lake and Adjacent	"Fewer fishermen"	(1)	"More people"	(2)

NOTE: The number in parenthesis (#) indicates the number of times the change was mentioned.

Table 10

Reasons Making Recreation Experience Pleasant or Unpleasant--Boat Fishing
Lake Barkley

Reasons	Percentage* of Users Responding:		
	Pleasant	Unpleasant	Not Important
General Reasons			
Characteristics and behavior of other people	100	-	-
Distance from other people	94	6	-
Number of people in other visitor groups	65	24	-
Number and type of other activities occurring here	94	-	6
Scenic views	100	-	-
Noise	82	-	18
Accidents or near accidents	82	-	12
Enforcement of rules/regulations	100	-	-
Car parking facilities	100	-	-
Theft	82	-	-
Vandalism	82	-	-
Land-Based Reasons			
Visual privacy from other people	18	-	6
Amount of facilities (restrooms, water, etc.)	76	12	12
Convenience to facilities (restrooms, water, etc.)	76	12	12
Maintenance of facilities	93	-	7
Condition of trees and landscape	43	-	7
Condition of grass or soil	29	-	7
Water-Based Reasons			
Water quality	100	-	-
Catching fish	88	12	-
People in areas they shouldn't be	65	24	6

*Percentages may not total 100% because of those responding "Does Not Apply."

Acceptability of techniques - Table 13 indicates the acceptability of different techniques for solving problems to the boat fishermen surveyed at Lake Barkley. The acceptability of most techniques is very clear: at least 60 percent of the respondents agreed on one of the three levels of acceptability for 10 of the 17 techniques. However, even for those techniques which were acceptable to most respondents, up to 43 percent responded that these techniques were unacceptable. Thus, project managers should expect some expression of opposition to any technique which they employ.

Table 13

User Acceptability of Techniques--Boat Fishing
Lake Barkley

Techniques	Levels of Acceptability		
	Percentage* of Users Responding:		
	Very Acceptable	Mildly Acceptable	Unacceptable
General Planning Techniques			
Keep major recreation areas more separated	70	6	24
Make vehicle access to areas less convenient	19	-	81
Make area's existence less obvious	38	19	43
Site Planning Techniques			
Reduce number of parking spaces	13	-	63
Management Techniques			
Procedures:			
Require prior reservations	6	44	50
Require permits	13	13	74
Charge/increase fees	19	-	81
Rules and Regulations:			
Impose more rules	-	13	87
Provide stricter enforcement of rules	19	19	63
Close areas when natural resource destruction reaches critical point	50	13	25
Close areas when they become "too full"	38	6	50
Reduce number of activities in same area	46	-	33
Limit number of people in visitor groups	18	-	72
Keep unnecessary vehicles out	25	6	56
Services:			
Provide more and better information	94	-	6
Increase maintenance and restoration	44	31	13
Reduce facilities and services	6	6	69

*Percentages may not total 100% because of those responding "Does Not Apply."

BOAT LAUNCHING

Orientation

Boat access to Lake Barkley is good from the many well-distributed boat launching ramps. The Corps of Engineers operates over 30 launching ramps, the majority of which are paved and range from one to four lanes in width. Parking is adequate at most ramps. Some launching areas have courtesy docks and restrooms. A few ramps are less than 1/4 mile from a main road, but most are at recreation areas which are from one to five miles from a main road. In addition to the Corps ramps, there are numerous others at Tennessee Valley Authority and other public and private access areas. There are also seven concessionaire marinas operating on the lake.

The findings in the remainder of this section are based on the User Survey. This survey obtained 10 responses from boat launchers at Eureka and the tailwater area.

User characteristics

Table 14 indicates the characteristics of the boat launchers surveyed at Barkley.

Table 14

Boat Launcher Characteristics

Age	Percent of Boat Launchers
<18	0
18 - 25	10
26 - 40	40
41 - 55	50
56 - 65	0
>65	0

Group Size	Percent of Boat Launchers
1	10
2	50
3 - 4	40
5 - 8	0
9 - 12	0
>12	0

Travel Time to Project Area	Percent of Boat Launchers
<15 minutes	0
15 - 30 minutes	30
30 - 60 minutes	50
1 - 2 hours	20
2 - 3 hours	0
3 - 5 hours	0
>5 hours	0

Visit Duration	Percent of Boat Launchers
1 - 4 hours	40
5 - 8 hours	40
1 day	0
2 days	20
3 days	0
4 days	0
5 - 7 days	0
>7 days	0

No. of Other Activities	Percent of Boat Launchers
0	80
1	10
2	0
3	0
4	10
5	0
6	0
>6	0

User opinions

Preferred launch times - The launch times that boat launchers prefer ranged from 0-10 minutes and averaged 5 minutes.

Reasons for pleasant/unpleasant experience - Tables 15 and 16 indicate the impact that different factors had on making the boat launching experience pleasant or unpleasant for users at the two areas surveyed.

Most boat launchers at the two ramps found their experience to be generally pleasant. The amount and convenience of facilities at Eureka were the only factors which users found unpleasant in a significant number of cases. None of the respondents found their experience so unpleasant that they said they would not return. None of the respondents reported any changes from their previous visit in the physical condition or people's use of the two areas.

Table 15

Reasons Making Recreation Experience Pleasant or Unpleasant--Boat Launching
Eureka

Reasons	Percentage* of Users Responding:		
	Pleasant	Unpleasant	Not Important
General Reasons			
Characteristics and behavior of other people	100	-	-
Distance from other people	100	-	-
Number of people in other visitor groups	33	-	67
Number and type of other activities occurring here	67	-	33
Scenic views	100	-	-
Noise	33	-	67
Accidents or near accidents	100	-	-
Enforcement of rules/regulations	100	-	-
Car parking facilities	100	-	-
Theft	-	-	100
Vandalism	-	-	100
Land-Based Reasons			
Amount of facilities (restrooms, water, etc.)	33	67	-
Convenience to facilities (restrooms, water, etc.)	33	67	-
Steepness of slopes	100	-	-
Maintenance of facilities	100	-	-
Condition of trees and landscape		-	-
Condition of grass or soil	100	-	-
Water-Based Reasons			
Water quality	100	-	-
Formal designation of places for your activity	-	-	33
Waiting time to launch boat	100	-	-
People in areas they shouldn't be	-	-	33

*Percentages may not total 100% because of those responding "Does Not Apply."

Table 16

Reasons Making Recreation Experience Pleasant or Unpleasant--Boat Launching Tailwater

Reasons	Percentage* of Users Responding:		
	Pleasant	Unpleasant	Not Important
General Reasons			
Characteristics and behavior of other people	100	-	-
Distance from other people	100	-	-
Number of people in other visitor groups	86	-	-
Number and type of other activities occurring here	86	-	14
Scenic views	14	-	71
Noise	57	-	28
Accidents or near accidents	43	14	43
Enforcement of rules/regulations	100	-	-
Car parking facilities	100	-	-
Theft	57	-	14
Vandalism	71	-	14
Land-Based Reasons			
Amount of facilities (restrooms, water, etc.)	86	14	-
Convenience to facilities (restrooms, water, etc.)	86	14	-
Steepness of slopes	100	-	-
Maintenance of facilities	100	-	-
Condition of trees and landscape	100	-	-
Condition of grass or soil	100	-	-
Water-Based Reasons			
Water quality	100	-	-
Formal designation of places for your activity	57	-	29
Waiting time to launch boat	100	-	-
People in areas they shouldn't be	71	-	14

*Percentages may not total 100% because of those responding "Does Not Apply."

Acceptability of techniques - Table 17 indicates the acceptability of different techniques for solving problems to the boat launchers surveyed at Barkley. The acceptability of most techniques is very clear: at least 60 percent of the respondents agreed on one of the three levels of acceptability for 15 of the 19 techniques. However, even for those techniques which were acceptable to most respondents, up to 40 percent responded that these techniques were unacceptable. Thus, project managers should expect some expression of opposition to any technique which they employ.

Table 17

User Acceptability of Techniques--Boat Launching
Lake Barkley

Techniques	Levels of Acceptability		
	Percentage* of Users Responding:		
	Very Acceptable	Mildly Acceptable	Unacceptable
General Planning Techniques			
Keep major recreation areas more separated	10	40	40
Make vehicle access to areas less convenient	-	-	100
Make area's existence less obvious	-	20	80
Site Planning Techniques			
Redesign area to accommodate fewer users	-	-	100
Design for greater distance between people	10	50	40
Reduce number of parking spaces	-	10	90
Management Techniques			
Procedures:			
Require prior reservations	-	-	70
Require permits	-	10	90
Charge/increase fees	-	20	80
Rules and Regulations:			
Impose more rules	-	10	90
Provide stricter enforcement of rules	-	60	40
Close areas when natural resource destruction reaches critical point	50	30	-
Close areas when they become "too full"	-	30	70
Reduce number of activities in same area	-	40	40
Limit number of people in visitor groups	-	10	70
Keep unnecessary vehicles out	-	70	20
Services:			
Provide more and better information	60	20	10
Increase maintenance and restoration	80	10	-
Reduce facilities and services	-	-	100

*Percentages may not total 100% because of those responding "Does Not Apply."

CAMPING

Orientation

Sixteen camping areas at Lake Barkley provide a diversity of campsite types, accommodating a variety of camping styles. Camping is permitted only at designated sites and campsites are limited to two camping units.

Only two of the campgrounds are fee areas with control stations and only one of these has electric hookups. Most have boat ramps and dumping stations in the recreation area. The number of sites in each campground range from less than 20 to more than 100. Most of the sites require a short walk to the shoreline, although some are located on the lake edge. Campers may also choose from a wide selection of vegetation conditions.

The State of Kentucky and the Tennessee Valley Authority provide additional camping near the project area.

The findings presented in the remainder of this section are based on the User Survey. This survey obtained 53 responses from campers at the Canal, Eureka, and Grand Rivers campgrounds.

User characteristics

Table 18 indicates the characteristics of the campers surveyed at Barkley. The most significant difference in the characteristics of the campers at Barkley from those of other study project areas is the relatively large number of camping groups of nine or more people per group.

Table 18

Camper Characteristics

Age	Percent of Campers	Group Size	Percent of Campers
<18	0	1	0
18 - 25	9	2	21
26 - 40	57	3 - 4	43
41 - 55	23	5 - 8	19
56 - 65	11	9 - 12	9*
>65	0	>12	8*

Travel Time to Project Area	Percent of Campers	Visit Duration	Percent of Campers
<15 minutes	2	1 - 4 hours	0
15 - 30 minutes	8	5 - 8 hours	0
30 - 60 minutes	38	1 day	0
1 - 2 hours	30	2 days	21
2 - 3 hours	13	3 days	19
3 - 5 hours	4	4 days	8
>5 hours	6	5 - 7 days	23
		>7 days	30

No. of Other Activities	Percent of Campers	Equipment	Percent of Campers
0	6	Tent	32
1	6**	Tent Camper	10
2	15	Truck Mounted Camper	8
3	17	Travel Trailer	42
4	21	Van	2
5	13	Motor Home	6
6	19		
>6	4		

*Significantly higher than total survey sample.
**Significantly lower than total survey sample.

User opinions

Spacing preferences - Tables 19 and 20 indicate the spacing (as measured on center of each site) that campers surveyed at Barkley and elsewhere prefer.

Table 19

Preferred Distance Responses* - Camping

Sample	Sample Size	Range	Mean	Median	Mode
All Campers Surveyed (11 projects)	511	10 - a	79	60	75
Barkley	53	25 - 300	72	75	50
Canal	22	25 - 120	64	60	75
Eureka	22	40 - 300	80	60-70	50
Grand Rivers	-	-	-	-	-

*in feet; See Appendix A for definitions of terms.
a - response of "alone" or "out of sight."

Table 20

Preferred Distance Responses in Planning Range and Preference Groupings*

Sample	% in Planning Range[1] (20'-120')	% in A[2] (20'-39')	% in B[2] (40'-59')	% in C[2] (60'-79')	% in D[2] (80'-120')
All Campers Surveyed	90%	20%	28%	31%	21%
Barkley	98	2	34	37	27
Canal	100	5	30	55	10
Eureka	95	0	38	19	43
Grand Rivers	-	-	-	-	-

*See Appendix A for definitions of terms; See Technical Report for full development of spacing preference information.
[1]Percentage of all preferred distance responses.
[2]Percentage of all preferred distance responses within the Planning Range.

Campers at Barkley greatly disfavor spacing in the group A range. There are also significant differences in the preferences of campers at the individual campgrounds for spacing groups B, C, and D.

Reasons for pleasant/unpleasant experience - Tables 21, 22, and 23 indicate the impact that different factors had on making the camping experience pleasant or unpleasant for users surveyed at the three camping areas. The responses of the campers surveyed vary somewhat from one campground to another, but campers at all three areas found their experience to be generally pleasant.

The amount of facilities at Canal and the amount/convenience of facilities at Eureka were unpleasant in a significant number of cases. The distance from other people and number of people in other groups were also unpleasant in a significant number of cases at Canal. Noise was a significant problem at Grand Rivers. Only one camper (at the Canal area) stated that he would not return (because of unclean bathrooms).

Tables 24 and 25 indicate the changes in the physical condition and people's use of the camping areas reported by campers from their previous visit.

Table 21

Reasons Making Recreation Experience Pleasant or Unpleasant--Camping
Canal

Reasons	Percentage* of Users Responding:		
	Pleasant	Unpleasant	Not Important
General Reasons			
Characteristics and behavior of other people	95	-	5
Distance from other people	86	14	-
Number of people in other visiting groups	86	14	-
Number and type of other activities occurring here	90	5	5
Fees charged	100	-	-
Scenic views	100	-	-
Noise	100	-	-
Accidents or near accidents	82	-	14
Enforcement of rules/regulations	95	5	-
Car parking facilities	95	5	-
Theft	82	-	5
Vandalism	82	-	5
Land-Based Reasons			
Visual privacy from other people	95	5	-
Amount of facilities (restrooms, water, etc.)	73	23	4
Convenience to facilities (restrooms, water, etc.)	86	9	5
Nearness to the water body	95	5	-
Steepness of slopes	91	9	-
Maintenance of facilities	100	-	-
Condition of trees and landscape	100	-	-
Condition of grass or soil	100	-	-
Water-Based Reasons			
Water quality	91	5	-

*Percentages may not total 100% because of those responding "Does Not Apply."

Table 22

Reasons Making Recreation Experience Pleasant or Unpleasant--Camping
Eureka

Reasons	Percentage* of Users Responding:		
	Pleasant	Unpleasant	Not Important
General Reasons			
Characteristics and behavior of other people	95	-	5
Distance from other people	100	-	-
Number of people in other visitor groups	50	5	41
Number and type of other activities occurring here	82	5	9
Fees charged	5	-	10
Scenic views	100	-	-
Noise	18	-	41
Accidents or near accidents	-	10	37
Enforcement of rules/regulations	57	-	28
Car parking facilities	90	5	5
Theft	-	-	38
Vandalism	-	5	36
Land-Based Reasons			
Visual privacy from other people	86	-	14
Amount of facilities (restrooms, water, etc.)	86	14	-
Convenience to facilities (restrooms, water, etc.)	82	18	-
Nearness to the water body	100	-	-
Steepness of slopes	86	9	5
Maintenance of facilities	100	-	-
Condition of trees and landscape	100	-	-
Condition of grass or soil	100	-	-
Water-Based Reasons			
Water quality	95	-	5

*Percentages may not total 100% because of those responding "Does Not Apply."

Table 23

Reasons Making Recreation Experience Pleasant or Unpleasant--Camping
Grand Rivers

Reasons	Percentage* of Users Responding:		
	Pleasant	Unpleasant	Not Important
General Reasons			
Characteristics and behavior of other people	100	-	-
Distance from other people	100	-	-
Number of people in other visitor groups	89	-	11
Number and type of other activities occurring here	100	-	-
Fees charged	-	-	-
Scenic views	100	-	-
Noise	78	22	-
Accidents or near accidents	100	-	-
Enforcement of rules/regulations	89	11	-
Car parking facilities	100	-	-
Theft	100	-	-
Vandalism	100	-	-
Land-Based Reasons			
Visual privacy from other people	100	-	-
Amount of facilities (restrooms, water, etc.)	100	-	-
Convenience to facilities (restrooms, water, etc.)	100	-	-
Nearness to the water body	100	-	-
Steepness of slopes	100	-	-
Maintenance of facilities	100	-	-
Condition of trees and landscape	100	-	-
Condition of grass or soil	89	11	-
Water-Based Reasons			
Water quality	89	-	-

*Percentages may not total 100% because of those responding "Does Not Apply."

Table 24

Positive and Negative Changes Noticed in the Physical Conditions of the Area - Items Mentioned by Campers

Area	Positive Changes	Negative Changes
Canal	"Improvements to sites" (7)	"Not as clean" (1)
	"More sites" (1)	
	"Playground added" (1)	
	"Better bathrooms" (1)	
Eureka	"New bathroom-shower building" (18)	"Need water hydrant" (3)
	"Cleaner area" (5)	"Rock rip-rap around tables" (1)
	"Improvements to sites" (5)	"Fluctuation of lake level" (1)
	"Lawn mowed" (2)	"Lack of beach area" (1)
	"New grills" (2)	"Need more tables" (1)
	"Rock rip-rap around tables" (1)	
Grand Rivers	"Cleaner" (2)	"Potholes" (1)
	"Bathhouse" (1)	
	"Better bathrooms" (1)	
	"Better maintenance" (1)	

NOTE: The number in parenthesis (#) indicates the number of times the change was mentioned.

Table 25

Positive and Negative Changes Noticed in the People's Use of the Area - Items Mentioned by Campers

Area	Positive Changes	Negative Changes
Canal	"Better people" (1) "Less trash" (1)	"Should eliminate pets and dogs" (1) "More ORV's" (1)
Eureka	"Area is cleaner" (2) "People not littering as much" (1)	"More people than in past" (3) "Starting to get crowded" (1) "Too many people since bathhouse put in" (1)
Grand Rivers	(None mentioned)	(None mentioned)

NOTE: The number in parenthesis (#) indicates the number of times the change was mentioned.

Acceptability of techniques - Table 26 indicates the acceptability of different techniques for solving problems to the campers surveyed at Barkley. The acceptability of most techniques is very clear: at least 60 percent of the respondents agreed on one of the three levels of acceptability for 12 of the 22 techniques. However, even for those techniques which were acceptable to most respondents, up to 43 percent responded that these techniques were unacceptable. Thus, project managers should expect some expression of opposition to any technique which they employ.

Table 26

User Acceptability of Techniques--Camping
Lake Barkley

Techniques	Levels of Acceptability Percentage* of Users Responding:		
	Very Acceptable	Mildly Acceptable	Unacceptable
General Planning Techniques			
Keep major recreation areas more separated	55	21	17
Make vehicle access to areas less convenient	13	8	77
Make area's existence less obvious	9	9	79
Site Planning Techniques			
Redesign area to accommodate fewer users	42	21	36
Design for greater distance between people	58	15	25
Reduce number of parking spaces	23	23	51
Change natural surface by hardening	21	34	43
Change natural surface by paving	77	13	9
Provide landscaped buffers	30	11	47
Management Techniques			
Procedures:			
Require prior reservations	11	25	64
Require permits	43	19	36
Charge/increase fees	21	19	58
Rules and Regulations:			
Impose more rules	15	8	77
Provide stricter enforcement of rules	34	34	21
Close areas when natural resource destruction reaches critical point	96	4	-
Close areas when they become "too full"	79	11	9
Reduce number of activities in same area	30	25	36
Limit number of people in visitor groups	19	6	72
Keep unnecessary vehicles out	70	23	7
Services:			
Provide more and better information	74	19	4
Increase maintenance and restoration	86	10	4
Reduce facilities and services	8	19	73

*Percentages may not total 100% because of those responding "Does Not Apply."

PICNICKING

Orientation

Of the several picnic areas, Kuttawa is the most developed and popular, receiving heavy use on weekends.

There are two picnic areas at Kuttawa: one is situated adjacent to the beach, partially sharing the area used primarily by sunbathers, the other is located away from the beach in a wooded area adjacent to a nature trail.

The findings presented in the remainder of this section are based on the User Survey. This survey obtained 12 responses from picnickers at Kuttawa and Grand Rivers.

User characteristics

Table 27 indicates the characteristics of the picnickers surveyed at Barkley. The most significant differences in the characteristics of the users surveyed at Barkley from those of other study project areas are: 1) picnickers at Barkley are younger; 2) had shorter travel times, and 3) participate in fewer other activities.

Table 27

Picnicker Characteristics

Age	Percent of Picnickers	Group Size	Percent of Picnickers
<18	17*	1	0
18 - 25	67*	2	25*
26 - 40	17**	3 - 4	25**
41 - 55	0	5 - 8	42*
56 - 65	0	9 - 12	8
>65	0	>12	0

Travel Time to Project Area	Percent of Picnickers	Visit Duration	Percent of Picnickers
<15 minutes	8	1 - 4 hours	75
15 - 30 minutes	33	5 - 8 hours	25
30 - 60 minutes	50*	1 day	0
1 - 2 hours	8**	2 days	0
2 - 3 hours	0	3 days	0
3 - 5 hours	0	4 days	0
>5 hours	0	5 - 7 days	0
		>7 days	0

No. of Other Activities	Percent of Picnickers
0	50*
1	25*
2	8**
3	8**
4	0
5	8
6	0
>6	0

*Significantly higher than total survey sample.
**Significantly lower than total survey sample.

User opinions

Spacing preferences - Tables 28 and 29 indicate the spacing that picnickers surveyed at Barkley and elsewhere prefer.

Table 28

Preferred Distance Responses*

Sample	Sample Size	Range	Mean	Median	Mode
All Picnickers Surveyed	190	1 - a	62	50	50
Lake Barkley	12	40 -100	65	75	40,70
Kuttawa	11	40 -100	61	50	40,70
Grand Rivers	1	100	100	100	100

*In feet; See Appendix A for definitions of terms.
a - response of "alone" or "out of sight."

Table 29

Preferred Distance Responses in Planning Range and Preference Groupings*

Sample	% in Planning Range[1] (20'-100')	% in A[2] (20'-39')	% in B[2] (40'-59')	% in C[2] (60'-79')	% in D[2] (80'-100')
All Picnickers surveyed	93%	23%	42%	20%	15%
Lake Barkley	100	0	46	36	18
Kuttawa	100	0	50	40	10
Grand Rivers	100	0	0	0	100

*See Appendix A for definitions of terms; See Technical Report for a full development of spacing preference information.

[1]Percentage of all preferred distance responses.
[2]Percentage of all preferred distance responses in the Planning Range.

Most picnickers at Kuttawa preferred group B and C spacing, and greatly disfavored group A spacing.

Reasons for pleasant/unpleasant experience - Table 30 indicates the impact that different factors had on making the picnicking experience pleasant or unpleasant for users surveyed at Kuttawa. Convenience to facilities and scenic views were unpleasant in a significant number of cases. The users surveyed at Grand Rivers indicated that the amount/location of facilities were the only unpleasant factors. No user responded that he would not return.

Tables 31 and 32 indicate the changes in the physical condition and people's use of the areas reported by picnickers from their previous visit.

Table 31

Positive and Negative Changes Noticed in the Physical Conditions of the Area - Items Mentioned by Picnickers

Area	Positive Changes	Negative Changes
Kuttawa	"Area is cleaner" (3)	"Trees and brush grown, now can't see lake" (1)
	"Bathrooms" (1)	"Higher water" (1)
	"Sand on beach" (1)	
Grand Rivers	(None mentioned)	(None mentioned)

NOTE: The number in parenthesis (#) indicates the number of times the change was mentioned.

Table 32

Positive and Negative Changes Noticed in the People's Use of the Area - Items Mentioned by Picnickers

Area	Positive Changes	Negative Changes
Kuttawa	"More maintenance" (2)	"Used to have lifeguards"(1)
	"Cleaner area" (1)	
Grand Rivers	(None mentioned)	(None mentioned)

NOTE: The number in parenthesis (#) indicates the number of times the change was mentioned.

Table 30

Reasons Making Recreation Experience Pleasant or Unpleasant--Picnicking
Kuttawa

	Percentage* of Users Responding:		
	Pleasant	Unpleasant	Not Important
General Reasons			
Characteristics and behavior of other people	91	-	9
Distance from other people	91	-	9
Number of people in other visitor groups	64	-	36
Number and type of other activities occurring here	73	-	27
Scenic views	82	18	-
Noise	82	9	9
Accidents or near accidents	45	-	9
Enforcement of rules/regulations	73	-	27
Car parking facilities	100	-	-
Theft	45	-	9
Vandalism	45	-	9
Land-Based Reasons			
Visual privacy from other people	91	9	-
Amount of facilities (restrooms, water, etc.)	100	-	-
Convenience to facilities (restrooms, water, etc.)	64	36	-
Nearness to the water body	100	-	-
Steepness of slopes	100	-	-
Maintenance of facilities	100	-	-
Condition of trees and landscape	91	9	-
Condition of grass or soil	100	-	-
Water-Based Reasons			
Water quality	82	9	9

*Percentages may not total 100% because of those responding "Does Not Apply."

Acceptability of techniques - Table 33 indicates the acceptability of different techniques for solving problems to the picnickers surveyed at Barkley. The acceptability of most techniques is very clear: at least 60 percent of the respondents agreed on one of the three levels of acceptability for 16 of the 22 techniques. However, even for those techniques which were acceptable to most respondents, up to 41 percent responded that these techniques were unacceptable. Thus, project managers should expect some expression of opposition to any technique which they employ.

Table 33

User Acceptability of Techniques--Picnicking
Lake Barkley

Techniques	Levels of Acceptability Percentage* of Users Responding: Very Acceptable	Mildly Acceptable	Unacceptable
General Planning Techniques			
Keep major recreation areas more separated	25	17	58
Make vehicle access to areas less convenient	17	-	83
Make area's existence less obvious	8	17	67
Site Planning Techniques			
Redesign area to accommodate fewer users	17	-	83
Design for greater distance between people	33	8	58
Reduce number of parking spaces	17	8	75
Change natural surface by paving	17	17	67
Provide landscaped buffers	33	-	58
Management Techniques			
Procedures:			
Require prior reservations	-	-	100
Require permits	-	-	100
Charge/increase fees	8	8	75
Rules and Regulations:			
Impose more rules	17	8	75
Provide stricter enforcement of rules	25	50	17
Close areas when natural resource destruction reaches critical point	91	-	9
Close areas when they become "too full"	41	17	41
Reduce number of activities in seam area	17	17	67
Limit number of people in visitor groups	-	-	100
Keep unnecessary vehicles out	67	17	17
Services:			
Provide more and better information	42	25	-
Increase maintenance and restoration	83	-	17
Reduce facilities and services	-	-	100

*Percentages may not total 100% because of those responding "Does Not Apply."

SHORELINE FISHING

Orientation

While opportunities for shoreline fishing exist at all recreation areas at Lake Barkley, the outlet is the only area having facilities specifically for shoreline fishermen. Developments such as paved parking, restrooms, and concrete steps and walks have all been installed at the outlet for the convenience of shoreline fishermen.

The findings in the remainder of this section are based on the User Survey. This survey obtained 7 responses from shoreline fishermen at Grand Rivers and the Outlet.

User characteristics

Table 34 indicates the characteristics of the shoreline fishermen surveyed at Barkley. The most significant differences in the characteristics of the respondents at Barkley from those of other study project areas are: 1) there were fewer people under 25, and 2) more fishermen were engaged in other activities.

Table 34

Shoreline Fishermen Characteristics

Age	Percent of Shoreline Fishermen	Group Size	Percent of Shoreline Fishermen
<18	0	1	14
18 - 25	0**	2	43
26 - 40	43	3 - 4	29
41 - 55	43	5 - 8	14
56 - 65	14	9 - 12	0
>65	0	>12	0

Travel Time to Project Area	Percent of Shoreline Fishermen	Visit Duration	Percent of Shoreline Fishermen
<15 minutes	0	1 - 4 hours	0
15 - 30 minutes	14	5 - 8 hours	14
30 - 60 minutes	43	1 day	0
1 - 2 hours	14	2 days	14
2 - 3 hours	29	3 days	29
3 - 5 hours	0	4 days	0
>5 hours	0	5 - 7 days	14
		>7 days	29

No. of Other Activities	Percent of Shoreline Fishermen
0	29**
1	29*
2	14
3	0
4	0
5	0
6	28*
>6	0

*Significantly higher than total survey sample.
**Significantly lower than total survey sample.

User opinions

Spacing preferences - Tables 35 and 36 indicate the spacing that shoreline fishermen at Barkley and elsewhere prefer.

Table 35

Preferred Distance Responses*

Sample	Sample Size	Range	Mean	Median	Mode
All shoreline fishermen surveyed	106	6 - a	76	35	50
Lake Barkley	7	50 - 75	53	50	50,75
Grand Rivers	2	60 - 75	68	60,75	60,75
Outlet	5	50 - 75	58	50	50

*In feet; See Appendix A for definitions of terms.
a - response of "alone" or "out of sight."

Table 36

Preferred Distance Responses in Planning Range and Preference Groupings*

Sample	% in Planning Range[1] (10'-100')	% in A[2] (10'-19')	% in B[2] (20'-39')	% in C[2] (40'-59')	% in D[2] (60'-100')
All Shoreline Fishermen surveyed	83%	20%	38%	24%	18%
Lake Barkley	100	17	0	33	50
Grand Rivers	100	0	0	0	100
Outlet	100	25	0	50	25

*See Appendix A for definitions of terms; See Technical Report for a full development of spacing preference information.

[1]Percentage of all preferred distance responses.
[2]Percentage of all preferred distance responses in the Planning Range.

The shoreline fishermen surveyed at Barkley tend to prefer greater spacing more frequently than those surveyed at other project areas.

Reasons for pleasant/unpleasant experience - Tables 37 and 38 indicate the impact that different factors had on making the shoreline fishing experience pleasant or unpleasant for users at the two areas surveyed. The responses vary only slightly between the two areas. Users at both areas found their experience to be pleasant. The only factor which was unpleasant in a significant number of cases was "catching fish" at Grand Rivers. None of the fishermen interviewed said they would not return.

Tables 39 and 40 indicate the changes in the physical condition and people's use of the areas reported by shoreline fishermen from their previous visit.

Table 37

Reasons Making Recreation Experience Pleasant or Unpleasant--Shoreline Fishing
Grand Rivers

Reasons	Percentage* of Users Responding:		
	Pleasant	Unpleasant	Not Important
General Reasons			
Characteristics and behavior of other people	100	-	-
Distance from other people	100	-	-
Number of people in other visitor groups	100	-	-
Number and type of other activities occurring here	100	-	-
Scenic views	100	-	-
Noise	100	-	-
Accidents or near accidents	50	50	-
Enforcement of rules/regulations	100	-	-
Car parking facilities	100	-	-
Theft	100	-	-
Vandalism	100	-	-
Land-Based Reasons			
Visual privacy from other people	100	-	-
Amount of facilities (restrooms, water, etc.)	100	-	-
Convenience to facilities (restrooms, water, etc.)	50	50	-
Nearness to the water body	100	-	-
Steepness of slopes	100	-	-
Maintenance of facilities	100	-	-
Condition of trees and landscape	100	-	-
Condition of grass or soil	100	-	-
Water-Based Reasons			
Water quality	100	-	-
Catching fish	-	100	-
Formal designation of places for your activity	50	50	-

*Percentages may not total 100% because of those responding "Does Not Apply."

Table 38

Reasons Making Recreation Experience Pleasant or Unpleasant--Shoreline Fishing Outlet

Reasons	Percentage* of Users Responding:		
	Pleasant	Unpleasant	Not Important
General Reasons			
Characteristics and behavior of other people	100	-	-
Distance from other people	100	-	-
Number of people in other visitor groups	100	-	-
Number and type of other activities occurring here	100	-	-
Scenic views	100	-	-
Noise	100	-	-
Accidents or near accidents	100	-	-
Enforcement of rules/regulations	100	-	-
Car parking facilities	100	-	-
Theft	100	-	-
Vandalism	100	-	-
Land-Based Reasons			
Visual privacy from other people	100	-	-
Amount of facilities (restrooms, water, etc.)	100	-	-
Convenience to facilities (restrooms, water, etc.)	100	-	-
Nearness to the water body	100	-	-
Steepness of slopes	100	-	-
Maintenance of facilities	80	20	-
Condition of trees and landscape	100	-	-
Condition of grass or soil	100	-	-
Water-Based Reasons			
Water quality	100	-	-
Catching fish	100	-	-
Formal designation of places for your activity	100	-	-

*Percentages may not total 100% because of those responding "Does Not Apply."

Table 39

Positive and Negative Changes Noticed in the Physical Conditions of the Area - Items Mentioned by Shoreline Fishermen

Area	Positive Changes	Negative Changes
Grand Rivers Outlet	"Cleaner area" (1) "Signs" (1) "New facilities" (1)	(None mentioned) (None mentioned)

NOTE: The number in parenthesis (#) indicates the number of times the change was mentioned.

Table 40

Positive and Negative Changes Noticed in the People's Use of the Area - Items Mentioned by Shoreline Fishermen

Area	Positive Changes	Negative Changes
Grand Rivers Outlet	(None mentioned) "Friendlier people" (1) "Fewer people than when dam (first) opened" (1)	(None mentioned) (None mentioned)

NOTE: The number in parenthesis (#) indicates the number of times the change was mentioned.

Acceptability of techniques - Table 41 indicates the acceptability of different techniques to the shoreline fishermen surveyed at Barkley. The acceptability of many techniques is very clear: at least 60 percent of the respondents agreed on one of the three levels of acceptability for 11 of the 22 techniques. However, even for those techniques which were acceptable to most respondents, up to 43 percent responded that these techniques were unacceptable. Thus, project managers should expect some expression of opposition to any technique which they employ.

Table 41

User Acceptability of Techniques--Shoreline Fishermen
Lake Barkley

Techniques	Levels of Acceptability Percentage* of Users Responding: Very Acceptable	Mildly Acceptable	Unacceptable
General Planning Techniques			
Keep major recreation areas more separated	57	14	14
Make vehicle access to areas less convenient	29	14	57
Make area's existence less obvious	14	14	72
Site Planning Techniques			
Redesign area to accommodate fewer users	-	-	100
Design for greater distance between people	20	20	60
Reduce number of parking spaces	29	14	57
Change natural surface by paving	33	33	-
Provide landscaped buffers	33	-	67
Management Techniques			
Procedures:			
Require prior reservations	57	14	29
Require permits	43	43	14
Charge/increase fees	43	14	43
Rules and Regulations:			
Impose more rules	-	17	83
Provide stricter enforcement of rules	33	17	50
Close areas when natural resource destruction reaches critical point	100	-	-
Close areas when they become "too full"	50	-	50
Reduce number of activities in seam area	33	33	33
Limit number of people in visitor groups	29	-	71
Keep unnecessary vehicles out	67	-	-
Services:			
Provide more and better information	86	14	-
Increase maintenance and restoration	67	-	33
Reduce facilities and services	-	-	100

*Percentages may not total 100% because of those responding "Does Not Apply."

SUNBATHING AND SWIMMING

Orientation

Several of the recreation areas at Lake Barkley provide designated sunbathing and swimming beaches. Sections of the shoreline are also used as undesignated swimming areas. Kuttawa is the only Corps operated day use area with a designated swimming beach. Kuttawa also offers a picnic area, nature trail, playground, and an adjacent marina. All beaches have restrooms nearby. Sunbathing and swimming areas are also provided by other agencies on the lake.

The findings reported in the remainder of this section are based on the User Survey. This survey obtained 17 responses from sunbathers and swimmers at Kuttawa and the Canal areas.

User characteristics

Table 42 indicates the characteristics of the sunbathers and swimmers surveyed at Barkley. The most significant differences in the characteristics of these users surveyed at Barkley from those surveyed at other project areas are: 1) only 12 percent were in a party of less than three people, and 2) all respondents travelled less than one hour to the activity area.

Table 42

Sunbather/Swimmer Characteristics

Age	Percent of Sunbathers/Swimmers	Group Size	Percent of Sunbathers/Swimmers
<18	18	1	6**
18 - 25	47	2	6**
26 - 40	35	3 - 4	53
41 - 55	0	5 - 8	29
56 - 65	0	9 - 12	6
>65	0	>12	0

Travel Time to Project Area	Percent of Sunbathers/Swimmers	Visit Duration	Percent of Sunbathers/Swimmers
<15 minutes	24	1 - 4 hours	53
15 - 30 minutes	53	5 - 8 hours	29
30 - 60 minutes	24	1 day	0
1 - 2 hours	0**	2 days	0
2 - 3 hours	0	3 days	12
3 - 5 hours	0	4 days	0
>5 hours	0	5 - 7 days	6
		>7 days	0

No. of Other Activities	Percent of Sunbathers/Swimmers
0	0
1	71
2	6
3	12
4	0
5	6
6	0
>6	6

**Significantly lower than total survey sample.

User opinions

Spacing preferences - Tables 43 and 44 indicate the spacing that sunbathers and swimmers surveyed at Barkley and elsewhere prefer.

Swimmers preferred closer spacing more frequently than did the total survey sample.

Table 43

Preferred Distance Responses*

Sample	Sample Size	Range	Mean	Median	Mode
All Sunbathers surveyed	161	3- a	30	20	15, 20
Lake Barkley	12	5-50	23	30	30
Canal	2	30	30	30	30
Kuttawa	10	5-50	22	20	30
All Swimmers surveyed	120	2-200	25	20	20
Lake Barkley (Kuttawa)	5	5-15	12	15	15

*In feet; See Appendix A for definitions of terms.
a - response of "alone" or "out of sight."

Table 44

Preferred Distance Responses in Planning Range and Preference Groupings*

Sample	% in Planning Range[1] (5'-50')	% in A[2] (5'-14')	% in B[2] (15'-20')	% in C[2] (21'-30')	% in D[2] (31'-50')
All Sunbathers surveyed	88%	27%	39%	20%	14%
Lake Barkley	100	27	18	46	9
Canal	100	0	0	100	0
Kuttawa	100	33	22	33	11
Sample	**% in Planning Range[1] (5'-50')**	**% in A[2] (5'-14')**	**% in B[2] (15'-24')**	**% in C[2] (25'-34')**	**% in D[2] (35'-50')**
All Swimmers surveyed	90%	25%	41%	19%	15%
Lake Barkley (Kuttawa)	100	33	67	0	0

*See Appendix A for definitions of terms; See Technical Report for a full development of spacing preference information.
[1]Percentage of all preferred distance responses.
[2]Percentage of all preferred distance responses in Planning Range.

Reasons for pleasant/unpleasant experience - Tables 45 and 46 indicate the impact that different factors had on making the sunbathing and swimming experience pleasant or unpleasant for users at the two areas surveyed.

Water quality was the only factor which was unpleasant in a significant number of cases at Kuttawa. None of the respondents indicated that they would not return.

Tables 47 and 48 indicate the changes in the physical condition and people's use of these areas by sunbathers and swimmers from their previous visit.

Table 45

Reasons Making Recreation Experience Pleasant or Unpleasant--Sunbathing/Swimming Canal

Reasons	Percentage* of Users Responding:		
	Pleasant	Unpleasant	Not Important
General Reasons			
Characteristics and behavior of other people	100	-	-
Distance from other people	100	-	-
Number of people in other visitor groups	100	-	-
Number and type of other activities occurring here	100	-	-
Scenic views	100	-	-
Noise	100	-	-
Accidents or near accidents	100	-	-
Enforcement of rules/regulations	50	50	-
Car parking facilities	100	-	-
Theft	100	-	-
Vandalism	100	-	-
Land-Based Reasons			
Amount of facilities (restrooms, water, etc.)	50	50	-
Convenience to facilities (restrooms, water, etc.)	100	-	-
Maintenance of facilities	100	-	-
Condition of trees and landscape	100	-	-
Condition of grass or soil	100	-	-
Water-Based Reasons			
Water quality	50	50	-
Formal designation of places for your activity	-	-	-
People in areas they shouldn't be			

*Percentages may not total 100% because of those responding "Does Not Apply."

Table 46

Reasons Making Recreation Experience Pleasant or Unpleasant--Sunbathing/Swimming
Kuttawa

Reasons	Percentage* of Users Responding:		
	Pleasant	Unpleasant	Not Important
General Reasons			
Characteristics and behavior of other people	92	-	8
Distance from other people	91	-	9
Number of people in other visitor groups	80	-	20
Number and type of other activities occurring here	77	8	15
Scenic views	92	-	8
Noise	69	8	23
Accidents or near accidents	77	-	15
Enforcement of rules/regulations	69	15	15
Car parking facilities	92	-	8
Theft	77	-	16
Vandalism	77	-	16
Land-Based Reasons			
Amount of facilities (restrooms, water, etc.)	92	8	-
Convenience to facilities (restrooms, water, etc.)	85	15	-
Maintenance of facilities	100	-	-
Condition of trees and landscape	100	-	-
Condition of grass or soil	100	-	-
Water-Based Reasons			
Water quality	78	22	-
Formal designation of places for your activity	66	-	-
People in areas they shouldn't be			

*Percentages may not total 100% because of those responding "Does Not Apply."

Table 47

Positive and Negative Changes Noticed in the Physical Conditions of the Area - Items Mentioned by Sunbathers/Swimmers

Area	Positive Changes	Negative Changes
Canal	"New campsites" (2)	(None mentioned)
	"Less smell on beach" (1)	
	"Boat docks" (1)	
Kuttawa	"Cleaner beach" (4)	(None mentioned)
	"Better sand" (4)	
	"Bigger swimming area" (2)	
	"Better grass" (2)	
	"More development" (1)	
	"More maintenance" (1)	

NOTE: The number in parenthesis (#) indicates the number of times the change was mentioned.

Table 48

Positive and Negative Changes Noticed in the People's Use of the Area - Items Mentioned by Sunbathers/Swimmers

Area	Positive Changes	Negative Changes
Canal	(None mentioned)	"More from out of state" (1)
Kuttawa	"People friendlier" (2)	"Wild kids (using drugs and alcohol)" (2)

NOTE: The number in parenthesis (#) indicates the number of times the change was mentioned.

Acceptability of techniques - Table 49 indicates the acceptability of different techniques for solving problems to the sunbathers and swimmers surveyed at Barkley. The acceptability of most techniques is very clear: at least 60 percent of the respondents agreed on one of the three levels of acceptability for 13 of the 18 techniques. However, even for those techniques which were acceptable to most respondents, up to 47 percent responded that these techniques were unacceptable. Thus, project managers should expect some expression of opposition to any technique which they employ.

Table 49

User Acceptability of Techniques--Sunbathing/Swimming
Lake Barkley

Techniques	Levels of Acceptability		
	Percentage* of Users Responding:		
	Very Acceptable	Mildly Acceptable	Unacceptable
General Planning Techniques			
Keep major recreation areas more separated	71	12	18
Make vehicle access to areas less convenient	24	12	65
Make area's existence less obvious	18	6	76
Site Planning Techniques			
Redesign area to accommodate fewer users	65	6	29
Design for greater distance between people	76	6	12
Reduce number of parking spaces	24	6	70
Management Techniques			
Procedures:			
Require permits	12	-	88
Charge/increase fees	18	-	82
Rules and Regulations:			
Impose more rules	41	6	53
Provide stricter enforcement of rules	41	18	41
Close areas when natural resource destruction reaches critical point	94	6	-
Close areas when they become "too full"	59	-	41
Reduce number of activities in same area	41	6	53
Limit number of people in visitor groups	6	-	88
Keep unnecessary vehicles out	47	6	47
Services:			
Provide more and better information	88	6	6
Increase maintenance and restoration	94	-	6
Reduce facilities and services	18	6	76

*Percentages may not total 100% because of those responding "Does Not Apply."

PART 3: ANALYSIS OF SELECTED PROBLEMS/SITUATIONS

PART 3: ANALYSIS OF SELECTED PROBLEMS/SITUATIONS

This final section identifies and examines selected problems and situations at Lake Barkley. The section is not intended to provide solutions to all project area problems. Nor is it a substitute for project area master planning. The solutions/techniques are intended to be only suggestions for further consideration by project area personnel, for they are most familiar with the intricacies associated with these problems.

In many cases, the project area staff is already aware of these problems or situations and is in the process of dealing with them. And in some cases, the solutions/techniques listed in Table 50 may not be practical or possible because of management, budget, or other constraints.

Table 50

Analysis of Selected Problems/Situations

Area/Subject	Problem/Situation	Possible Solutions/Techniques
Grand Rivers - camping	Overcrowding & Overuse--Poorly identified sites and unclear site boundaries have resulted in overcrowding, overuse, & in some cases, camping between sites.	• define site boundaries more clearly. • post a site number at each site. • designate group, family or double sites. • designate a space for vehicles and a pad for trailers & tents at each site.
Canal - camping	Underuse--the walk-in tent area receives little use. Proximity to trailer sites & a large parking area may deter use.	• relocate walk-in tent area to a site that is more secluded, more wooded, & more suited to the tent camping experience. • provide separate parking & access for tent sites. • provide buffers in existing area.
Kuttawa & other recreation areas - picnicking	Because all picnic sites consist of only single tables, groups of picnickers are not provided for.	• provide some end to end picnic table arrangements to serve families and groups. • relocate tables between seasons to reduce overuse. • set aside a group area with a separate parking area.

Area/Subject	Problem/Situation	Possible Solutions/Techniques
Grand Rivers - picnicking	The area is underused.	• provide signs to inform people that the area exists. • promote the area as a group picnic area (although the opportunity for engaging in other activities is quite limited).
Kuttawa - day use	Overuse--Heavy foot traffic to the bathrooms has resulted in a worn path.	• harden path between beach area and restrooms (e.g. wood chips, gravel, etc.).
	Overuse & User Conflicts--boaters who randomly beach their boats & enter the swimming area have caused wear on the shore & boater/swimmer conflicts.	• provide docks to tie up boats o tside swimming areas.
Tailwater and Other boat launching areas	Overcrowding & Overuse--when all parking stalls are filled, vehicles & trailers are parked on the side of roads, & on the grass, causing crowding, conflicts & overuse.	• designate & harden additional parking area. • designate an overflow parking area on the grassed area.
	Overcrowding--During heavy use, delays are caused by users preparing boats for launch only after they've backed down to the water & by users inexperienced in launching or retrieving a boat.	• post signs instructing launchers to prepare boats for launching prior to pulling onto the ramp. • provide a traffic control officer at the ramp during peak use periods such as Holiday weekends.
	Overcrowding--Delays & conflicts are often caused by boaters or fishermen who are alone & have no one to stay with the boat while parking or retrieving their boat.	• provide courtesy docks to tie boats to, to solve problem, especially for the convenience of those with easily-damaged fiberglass boats at ramps with rip-rap.
Tailwater-fishing	Fishermen leave fish-trimmings & unused bait on the rocks & parking areas.	• provide suitable fish cleaning stations & trash receptacles at both the boat ramp & shore fishing areas.
	Overuse--shoreline fishermen often park on the grass adjacent to the paved lot.	• install traffic control techniques (curb, chain, posts) to keep traffic in designated areas. • harden (gravel, bituminous) parking spaces closer to where people have parked off the paved lot and the severely eroded & compacted the soil areas.

APPENDICES

APPENDIX A: KEY TERMS

1. Activity area - The specific area where an individual primary activity occurs (e.g., a campground, the lake, a hiking trail, a picnic area, etc.).

2. Capacity, recreational carrying - The capability of a recreational resource to provide opportunity for certain types of satisfactory recreation experiences over time without significant degradation of the resource. Inherent in this view of carrying capacity are resource (biophysical) and social (psycho-social) capacities.

3. Capacity, resource - The level of recreational use of a resource beyond which irreversible biological deterioration takes place or degradation of the physical environment makes the resource no longer suitable or attractive for that recreational use.

4. Capacity, social - The level of recreational use of a resource or area beyond which the user's expectation of the experience is not realized and he/she does not achieve a reasonable level of satisfaction.

5. Carrying capacity guidelines - The levels of use and the methods used to obtain and achieve them which are recommended in this report.

6. Factors - The characteristics and phenomena which influence carrying capacity.

7. Indicators - The phenomena which can be used to identify or measure the degree of overcrowding or overuse, and which can be used in conjunction with a monitoring system to help predict when problems of overuse and overcrowding will occur if preventive measures are not taken.

8. Management/site survey - The initial survey conducted at the study project areas where resource managers, rangers, and maintenance personnel were interviewed and a reconnaissance was made of "overused," "overcrowded," "underused," and "well-balanced" recreation areas. (See Appendix B)

9. Mean - The measure of central value defined as the sum of all observations divided by the number of observations.

10. Median - The measure of central value defined as the point on the scale of observations which is the middle observation (if there is an odd number of cases) or which is the mean of the two central observations (if there is an even number of cases).

11. Mode - The measure of central value defined as the observation with the largest frequency.

12. Monitoring - The periodic assessment of the impact that use levels have on the social capacity or resource capacity of an area.

13. Overcrowding - A condition where the user does not achieve a satisfactory recreational experience because of too many people, inadequate distances between sites, etc.

14. Overuse - A condition where (during the course of a season/year) degradation of the physical environment makes the resource no longer suitable or attractive for recreational use.

15. Planning range - The range of spacing distances for an activity which satisfies the spacing preferences of the majority of recreators participating in that activity, which at the same time accounts for other considerations (e.g., cost, safety, equity, etc.).

16. Preference distribution - The set of preference groupings for an activity which can be modified to develop the social carrying capacity of an area.

17. Preference groupings - The range of spacing distances for an activity which satisfies the similar spacing preferences of a group of recreators participating in that activity.

18. Primary activity - The major recreation activity which brought the visitor to the recreation area.

19. Project area - The land and water area of the total Corps of Engineers Project.

20. Project management - The project area staff, district personnel, and other people involved with project area management.

21. Recreation area - Corps-managed areas specifically identified for recreational use within the total Project Boundary; usually named.

22. Recreation day - A standard unit of use consisting of a visit by one individual to a recreation development or area for recreation purposes during any reasonable portion or all of a 24-hour period.

23. Recreation environment - An activity area together with its various recreation settings.

24. Recreation resource - The land and/or water areas, with associated facilities, which provide a base for outdoor recreation activities.

25. Recreation setting - The physical, development/control, activity/use relationship components of an activity area; taken as a whole, the various settings comprise a particular "recreation environment" for each activity area.

26. Recreation unit - A campsite, picnic table, boat, off-road vehicle, user group, or other unit which when spaced together with other units represents a use level or density.

27. Representative recreation setting - The most typical recreation setting for a particular activity.

28. Secondary activities - Incidental activities; activities which are supplemental to the primary activity.

29. Study activity area - An activity area at which the management/site survey and the user survey was conducted.

30. Study project area - One of the 11 project areas at which the management/site survey and the user survey were conducted. These project areas are: Barkley Lock and Dam, Benbrook Lake, Hartwell Lake, McNary Lock and Dam, Milford Lake, New Hogan Lake, Lake Ouachita, Lake Shelbyville, Shenango River Lake, Somerville Lake, and Surry Mountain Lake.

31. Title 36 - Part 327, Chapter III, of Title 36 of the Code of Federal Regulations which provides rules and regulations governing the public use of water resource development projects administered by the Army Corps of Engineers.

32. Underuse - A condition where use levels are significantly less than their potential service level.

33. User survey - The survey that provided user preference information used in developing social capacity guidelines; information was obtained from users at the study project areas by means of a questionnaire (see Appendix B).

34. Well-balanced use - A condition which exhibits just the right amount of use to satisfy users and protect the resource.

APPENDIX B: EXAMPLE SURVEY FORMS

This Appendix includes on the following pages examples of the survey forms that were used during the Management/Site Survey and the User Survey.

MANAGEMENT/SITE SURVEY

PICNICKING QUESTIONNAIRE

(Resource Manager, Head Ranger, Maintenance Foreman)

Project Area Name _____

Respondent Name _____ Title _____

Interviewer _____ Date _____

1. PICNICKING USE AREA INFORMATION (selected areas)

Recreation Area/Use Area Names	Support Facilities	Fee Charged	Acres Total Use Area	Acres Activity Area Only	Total Picnic Sites	List Primary Activities Adjacent to Area	When Started
OVERCROWDED							
OVERUSED							
UNDERUSED							
WELL-BALANCED							

Picnicking

2. VISITOR CHARACTERISTICS RELATED TO OVERCROWDING/OVERUSE

Recreation Area/Use Area Names (same as in #1)	# of picnicking groups on typical recreation season weekend day	Typical Length of Stay	Typical Ages	Typical Group Size	Origin of visitors[1] % U	% S	% R	Approximate # of miles most visitors travel to use area High	Average	Average Frequency of visits per year
OVERCROWDED										
OVERUSED										
UNDERUSED										
WELL-BALANCED										

NOTES: [1] U = Urban location (city), S = Suburban location, R = Rural

Picnicking

3. CAUSES & EFFECTS OF OVERCROWDING/OVERUSE

Use Area Names (same as in #1 & #2)	Actual Complaints (list in order of frequency)	Causes		Effects	
		Observed	Surmised	Observed	Surmised
OVERCROWDED					
OVERUSED					
UNDERUSED					
WELL-BALANCED					

Picnicking

OVERUSE/DEGRADATION

...e areas which experience overuse (from #1)	Off-season restoration potential: Recovers naturally	Off-season restoration potential: Requires treatment	Off-season restoration potential: Beyond off-season restoration	Approximate Dates of Recreation season (_____ to _____)	When signs of degradation first occur: Approx. date	When signs of degradation first occur: Approx. visitor groups to date	When highest degradation is reached: Approx. date	When highest degradation is reached: Approx. visitor groups to date

5. INDICATORS (SIGNS) OF OVERCROWDING

Indicators	Assign relative importance using a numerical rating on a scale of 1 (least) to 10 (most)	Comments
o Increase in the # of complaints		
o Arguments/conflicts between picnickers		
o Shorter stays		
o Fewer returnees		
o Increase in crime		
o Increase in noise		
o Picnicking, in non-picnic areas		
o Crowded support facilities		
o Increase in litter		
o Increase in resource and facility destruction		
o Occurrence of displacement/succession (changes in visitor characteristics)		
o Increase in number of accidents involving vehicles		
o Increase in use levels		

(Please list others below)

o

o

o

Picnicking

b. INDICATORS OF OVERUSE/DEGRADATION

Indicators	Assign relative importance using a numerical rating on a scale of 1(least) to 10 (most)	Comments
o Ground cover wearing away		
o Damaged trees and/or undergrowth		
o Absence/change in wildlife		
o Increased erosion/sedimentation		
o Little deadfall		
o Compacted soils		
o Increased litter/trash		
o Trees cut down		
o Increased runoff		
o Need for replacement of support facilities before normal life period		
o Rodent infestation		

(Please list others below)

o

o

o

o

7. FACTORS AFFECTING RESOURCE CARRYING CAPACITY

Picnicking

Factors	Assign relative importance using a numerical rating on a scale of 1 (least) to 10 (most)	Comments
o Resiliency of vegetation type		
o Resiliency of soils		
o Resiliency of wildlife		
o Degree of normal maintenance applied		
o Degree of off-season restoration applied		
o Site drainage		
o Slope/topography		
o Climate/micro-climate		
o Group size		
o Slope orientation		
o Tree cover		
o Level of development (e.g. paved roads/paths vs. unpaved roads/paths)		

(Please list others below)

o

o

o

8. FACTORS AFFECTING SOCIAL CARRYING CAPACITY

Factors	Assign relative importance using a numerical rating on a scale of 1 (least) to 10 (most)	Comments
o Similarity of visitor groups		
o Slope orientation		
o Distance from highway access		
o Proximity to the water		
o Scenic views or vistas		
o Quality/variety of natural amenities		
o Number, type, and degree of man-made intrusions or disturbances (power lines, buildings, etc.)		
o Visual screening between picnickers		
o Density/type of vegetation		
o Distance between picnic sites		
o Degree of designation		
o Level of support facilities		
o Proximity to support facilities		
o Size of picnicking area		
o Charging of fees		
o Compatibility of nearby primary activities		
o Single purpose or multi-purpose recreation area		
o Distance traveled		
o Frequency of visits		
o Origin of user (urban, suburban, rural)		
o Configuration of area		
o Degree of maintenance		

(Please list other factors)

o

o

9. PRESENT/PAST CAPACITY MANAGEMENT

Picnicking

Use areas where capacity management techniques were, or are now, applied (Name)	Past (√)	Present (√)	List capacity management techniques(s) used	Describe level of effectiveness (pros/cons regarding visitor satisfaction and resource protection)	Assessment of management feasibility (pros/cons why the technique could or could not be implemented)

10. POSSIBLE CARRYING CAPACITIES

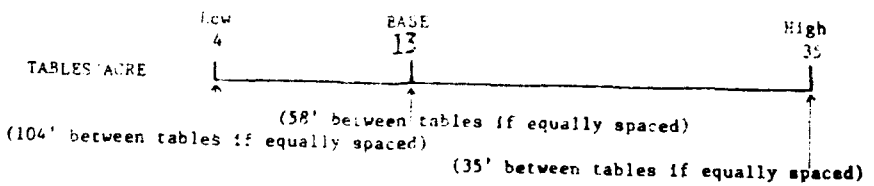
Picnicking

Use Area Names	Present capacity actual or estimated	Best guess as to what the capacity should be	Principal factors
THE MOST OVERCROWDED AREA:			
THE MOST OVERUSED AREA:			
THE MOST UNDERUSED AREA:			
THE MOST WELL-BALANCED AREA:			

B11

EXAMPLES FROM BUREAU OF OUTDOOR RECREATION CAPACITY RESEARCH:

(Use as a general guide when estimating what the capacity should be)



MANAGEMENT/SITE SURVEY

CAMPING

USE AREA ANALYSIS SHEET

(for URDC staff use)

Project Area Name _____ Field Analyst(s) _____

Recreation Area and/or Use Area _____

_____ Weather _____

Code # _____ Date _____

				ANSWER COLUMN	COMMENT CODE	COMMENTS:
SITE AWARE-NESS	Signage (camping or name)	Between main highway and use area entrance				
		At use area entrance				
	Exposure of Site	Between main highway and use area entrance				
		At use area entrance				
	Relation-ship to Main Highway	Distance to area from main highway				
SITE ACCESS	Road Conditions	Road to site from main highway				
			Paved(P) or Unpaved(U)			
			Condition (E, G, P)			
			Estimated Width			
		Road within use area				
			Paved(P) or Unpaved(U)			
			Condition (E, G, P)			
			Estimated Width			
		Presence of informal roads				
SLOPES & VEGETATION	Slopes	% of area 0 - 5%				
		% of area 6 - 9%				
		% of area 10%+				
		Existence of unique land form				
	Vegetation	Density of trees				
			% dense			
			% moderate			
			% sparse			
			% little or none			
		Density of understory				
			% dense			
			% moderate			
			% sparse			
			% little or none			
	On the Use Area	Geologic, cultural, archeo-logic features				
		Abundance of wildlife				
		Water feature				

NATURAL AMENITIES	From the Use Area	Visibility to water (insert) O - outstanding G - good U - undesirable	Severely obstructed		
			Moderately obstructed		
			Mildly obstructed		
			Unobstructed		
		Visibility to other natural areas (insert) O - outstanding G - good U - undesirable	Severely obstructed		
			Moderately obstructed		
			Mildly obstructed		
			Unobstructed		
		Distance to lake			
CONDITION OF NATURAL FEATURES	Vegetation & Soils	Dead or trampled vegetation			
		Evidence of taking			
		Compacted soils			
	Drainage	Wet soils/standing water			
		Erosion			
CILITIES & ERVICES	Facility/ Service Distribution (S - Site D-Distributed C - Centralized)	Electric hook-ups			
		Water hook-up			
		Improved pad			
		Picnic tables			
		Cooking grill			
		Firewood			
		Drinking water (cold)			
		Hot water			
		Showers			
		Flush toilets			
		Vault toilets			
		Pit toilets			
		Dumping station			
		Shelter			
		First aid station			
		Telephone			
		Lighting (R - road, P - Parking W - Walkway, C - Comfort area			
		Recreation area or equipment			
		Convenience store			
	Condition	Excellent			
		Good			
		Need attention			
ANNING ESIGN	Distance between campsites	Minimum			
		Maximum			
		Average			
	Distance between campsites and the facilities	Minimum			
		Maximum			
		Average			
	Space for camper unit maneuverability	Ample			
		Acceptable			
		Restrictive			
SPE		Controlled (gate, attendant)			

Car Parking	Parking s[illegible] on e[illegible] site			
	Road parking			
Buffer between Campsites	Man-made			
	Natural vegetation			
	Planted landscape			
	None			

RELATIONSHIP OF CAMPING USE AREA TO OTHER USE AREAS

Use area name	Activity	Estimated direct distance from camping use area	Pedestrian accessibility to other use area: Easy	Moderate	Difficult	Visibility to other use area: Obstructed	Semi-obstructed	Unobstructed	Reasons for accessibility and/or visibility situation

ANALYST'S PERCEPTION OF ACTIVITY AREA'S CARRYING CAPACITY

List the resource/physical factors you feel most affect carrying capacity on this site

_____

_____

_____

_____

_____

Should resource/physical carrying capacity of this site be: _____ higher _____ lower _____ same

List possible techniques which might be used to increase and/or to limit capacity on this site.

_____

_____

_____

CORPS OF ENGINEERS USER CAPACITY SURVEY

Notations ☐

Date _____ Day _____ OMB Clearance # 49-R0419

Time (hour) _____ Expires October 1983

Weather _____ Project Area Name _____

Interviewer _____ Recreation Area Name _____

Activity _____ Code _____ Activity Area _____ Code _____

We are conducting a survey for the Army Corps of Engineers at selected Corps recreation areas throughout the Country. Through these surveys, we will discover how visitors feel about overcrowding and overuse of these recreation areas. The Corps will use this information to help make decisions about the use and protection of its recreation areas. Would you be willing to take fifteen minutes of your time to answer some questions about your visit here?

BASIC VISITOR CHARACTERISTICS

1. In which category is your age?

17 & under	☐
18 - 25	☐
26 - 40	☐
41 - 55	☐
56 - 65	☐
66 & over	☐

2. How large is your group?

1	☐
2	☐
3- 4	☐
5- 8	☐
9-12	☐
13+	☐

3. Is this your main destination or a stopover on a trip?

Main destination	☐
Stopover on trip	☐

4. How long did it take you to travel here from your home ___(✓) or last destination ___(✓)?

Under 15 minutes	☐
15-30 minutes	☐
30 min. - 1 hour	☐
1 - 2 hours	☐
2 - 3 hours	☐
3 - 5 hours	☐
5+ hours	☐

VISITOR PARTICIPATION

5. How many times did you participate in this activity anywhere last year? (if "0", go to Question 7)

0	☐
1 - 5	☐
6 - 10	☐
11 - 20	☐
21 - 30	☐
31+	☐

6. How many times have you participated in this activity at this Lake?

a) Last year?		b) So far this year?	
0	☐	0	☐
1- 2	☐	1- 2	☐
3- 4	☐	3- 4	☐
5- 7	☐	5- 7	☐
8-10	☐	8-10	☐
11-19	☐	11-19	☐
20+	☐	20+	☐

7. How long are you staying on this visit?

1 - 4 hours	☐
5 - 8 hours	☐
1 day (overnight)	☐
2 days	☐
3 days	☐
4 days	☐
5 - 7 days	☐
8 or more days	☐

8. Have you participated in this activity at this specific location anytime before this visit?

No ☐ (go to #9) Yes ☐ Please list any changes you have noticed in the physical condition of this location or in people's use of the area.

Physical condition:	People's use of the area:
☐ Positive	☐ Positive
☐ Negative	☐ Negative

9. Would you say the number of people who are now participating in this activity are:

too many ☐ too few ☐ just the right number ☐

WES Form [illegible]
February, 1979

10. a) Would you say that the distance between you and other people is:

too far ☐ (to 10c) just right ☐ (to 10c) too close ☐

(Actual or estimated distance to be recorded by interviewer _____)

b) If other people are too close, how far away would you like them to be? ☐ Not Applicable

just a little farther ☐ twice as far ☐ three times farther ☐ more than 3 times ☐

c) What is the closest distance you would accept? _____

d) What distance would you like them to be? _____

11. a) Which of the following reasons are making your present activity at this location pleasant or unpleasant?

	Pleasant	Un-pleasant	Not Important	Does Not Apply
GENERAL REASONS				
1. Characteristics and behavior of other people	☐	☐	☐	☐
2. Distance from other people	☐	☐	☐	☐
3. Number of people in other visitor groups	☐	☐	☐	☐
4. Number and type of other activities occurring here	☐	☐	☐	☐
5. Fees charged	☐	☐	☐	☐
6. Scenic views	☐	☐	☐	☐
7. Noise	☐	☐	☐	☐
8. Accidents or near accidents	☐	☐	☐	☐
9. Enforcement of rules/regulations	☐	☐	☐	☐
10. Car parking facilities	☐	☐	☐	☐
11. Theft	☐	☐	☐	☐
12. Vandalism	☐	☐	☐	☐
Others _____	☐	☐	☐	☐
_____				
LAND-BASED REASONS				
13. Trees/natural landscape	☐	☐	☐	☐
14. Visual privacy from other people	☐	☐	☐	☐
15. Amount of facilities (restrooms, water, etc.)	☐	☐	☐	☐
16. Convenience to facilities (restrooms, water, etc.)	☐	☐	☐	☐
17. Nearness to the water body	☐	☐	☐	☐
18. Steepness of slopes	☐	☐	☐	☐
19. Maintenance of facilities	☐	☐	☐	☐
20. Condition of trees and landscape	☐	☐	☐	☐
21. Condition of grass or soil	☐	☐	☐	☐
Others _____	☐	☐	☐	☐
_____	☐	☐	☐	☐
_____	☐	☐	☐	☐
WATER-BASED REASONS				
22. Water quality	☐	☐	☐	☐
23. Catching fish	☐	☐	☐	☐
24. Formal designation of places for your activity	☐	☐	☐	☐
25. Waiting time to launch boat	☐	☐	☐	☐
26. Waiting time to retrieve boat	☐	☐	☐	☐
27. People in areas they shouldn't be	☐	☐	☐	☐
Others _____	☐	☐	☐	☐
_____	☐	☐	☐	☐
_____	☐	☐	☐	☐

b) Will any of the above reasons prevent you from coming here again?

No ☐ Yes ☐

If yes, which reasons (selected from reasons checked "unpleasant" above)?

_____ _____ _____

_____ _____ _____

12. If recreation areas have too many people for each to enjoy the activity or if areas become damaged by too much use, there are some solutions for reducing that overcrowding or overuse. Please indicate which of the following possible solutions you would find very acceptable, mildly acceptable, or unacceptable for reducing crowding and/or natural resource destruction in this location. (If this location is not overcrowded or overused, assume that it is for this question.)

POSSIBLE SOLUTIONS FOR OVERCROWDING OR OVERUSE	Very Acceptable	Mildly Acceptable	Unacceptable	Does Not Apply
PUBLIC AWARENESS/EASE OF ACCESS SOLUTIONS				
1. Make vehicle access to areas less convenient.	☐	☐	☐	☐
2. Make the area's existence less obvious to the general public (fewer signs and directions)	☐	☐	☐	☐
3. Provide more and better information on how to use the area	☐	☐	☐	☐
ACTIVITY RELATIONSHIPS & USE DENSITY				
4. Keep major recreation activities more separated from one another.	☐	☐	☐	☐
5. Reduce the number of different activities occurring in the same area	☐	☐	☐	☐
6. Design for greater distance between people	☐	☐	☐	☐
7. Limit the number of people in each group	☐	☐	☐	☐
8. Change natural surfaces by hardening them to withstand more use.	☐	☐	☐	☐
9. Increase maintenance and restoration to allow more use	☐	☐	☐	☐
PLANNING & DESIGN SOLUTIONS				
10. Reduce the type and number of facilities and services provided	☐	☐	☐	☐
11. Keep unnecessary vehicles out of areas	☐	☐	☐	☐
12. Reduce number of parking spaces to limit number of users	☐	☐	☐	☐
13. Provide landscaped buffers between visitor groups to increase privacy	☐	☐	☐	☐
14. Redesign area to accommodate fewer users	☐	☐	☐	☐
RULES & REGULATIONS SOLUTIONS				
15. Have stricter enforcement of regulations	☐	☐	☐	☐
16. Impose more rules and regulations	☐	☐	☐	☐
17. Require prior reservations to use areas.	☐	☐	☐	☐
18. Require permits to use areas	☐	☐	☐	☐
19. Close down areas when natural resource destruction reaches critical point	☐	☐	☐	☐
20. Charge fees or increase fees now charged	☐	☐	☐	☐
21. Close gates when areas get "too full".	☐	☐	☐	☐
OTHERS				
_____	☐	☐	☐	☐
_____	☐	☐	☐	☐
_____	☐	☐	☐	☐
_____	☐	☐	☐	☐

13. Please answer the following questions about your other recreation activities on this visit.

	a) What are your other recreation activities on this visit?	b) Are they within walking distance or driving distance from this location? (use launching location for boat activities) (1) Walking distance	(2) Driving distance	c) What is your main recreation activity on this visit?
1.	Camping	☐	☐	☐
2.	Boating	☐	☐	☐
3.	Waterskiing	☐	☐	☐
4.	Swimming	☐	☐	☐
5.	Sunbathing	☐	☐	☐
6.	Picnicking	☐	☐	☐
7.	Shoreline fishing	☐	☐	☐
8.	Boat fishing	☐	☐	☐
9.	Hiking	☐	☐	☐
10.	Horseback riding	☐	☐	☐
11.	Off-road vehicle riding	☐	☐	☐
12.	_____	☐	☐	☐
13.	_____	☐	☐	☐
14.	_____	☐	☐	☐
15.	_____	☐	☐	☐
16.	None	☐	☐	☐

RECREATION EQUIPMENT RECORD

Camping

- ☐ Tent
- ☐ Tent camper
- ☐ Truck-mounted camper
- ☐ Travel trailer
- ☐ Van
- ☐ Motor home
- ☐ _____
- ☐ _____

Boat Activities

- ☐ Day sailer
- ☐ Sailer (cabin)
- ☐ Canoe
- ☐ Row boat
- ☐ Power boat (less than 25 hp)
- ☐ Power boat (25+ hp)
- ☐ Houseboat or cruiser
- ☐ _____
- ☐ _____

Off-Road Vehicle Riding

- ☐ Trail bike
- ☐ Motorcycle
- ☐ ATV
- ☐ Dune buggy
- ☐ 4-wheel drive
- ☐ _____
- ☐ _____

COMMENTS:

AD-A089 460 URBAN RESEARCH AND DEVELOPMENT CORP BETHLEHEM PA F/G 13/2
RECREATION CARRYING CAPACITY FACTS AND CONSIDERATIONS. REPORT 1--ETC(U)
JUL 80 DACW39-78-C-0096
UNCLASSIFIED WES-MP-R-80-1-1 NL

2 OF 2
AD A089460

REPLACEMENT QUESTIONS TO ASK DURING BOAT LAUNCHING INTERVIEWS

(Write answers and comments directly on the User Survey Interview Sheet)

10. a) Would you say that the time it takes you to launch your boat at this ramp is:

too long ☐ long, but tolerable ☐ just right ☐

(Approximately how long does it take to launch your boat at this ramp? Actual or estimated time to be recorded by interviewer _____)

b) How long would you prefer it to take:

just a little faster ☐ twice as fast ☐ three times faster ☐ more than three times faster ☐

c) What could be done to expedite boat launching at this ramp:

_____

_____

_____

APPENDIX C: PROJECT AREA DESCRIPTION

Barkley

Location

Lake Barkley Lock and Dam (Nashville District) is located on the Cumberland River, 31 miles above its confluence with the Ohio River. Paducah, Kentucky is about 25 miles west of the dam. Nashville, Tennessee is about 100 miles to the southeast and St. Louis, Missouri is 150 miles to the northwest.

Authorization and purpose

The Barkley Dam Project was authorized under the River and Harbor Act of 3 September 1954 for the purposes of flood control, navigation, and hydroelectric power generation. The Barkley Project serves as a major unit in the comprehensive plan for development of the Cumberland River Basin.

Project area size and features

At the normal recreational elevation (359 feet msl), the lake has a surface area of 57,920 acres and the land area is 50,680 acres (36,284 acres of fee and 14,396 acres of flowage easement). The lake extends 118 river miles upstream to Cheatham Lock and Dam, varying in width from 1/2 to 2-1/2 miles.

Depth of the main navigation canal is maintained at nine feet to accommodate commercial barge traffic. Water depths outside the main channel range from five feet to zero feet. In times of low water, lands normally submerged show above the lake surface. In autumn the water level is drawn down about five feet to accommodate the anticipated spring runoff. Submerged stump fields, old roadbeds, and railroad grades are found in certain portions of the lake and pose some danger to recreational boaters. There is moderate evidence of shoreline erosion, and siltation necessitates occasional dredging of the lake bed.

Much of the lake's western shoreline downstream of Dover, Tennessee is part of the Land Between the Lakes, a 170,000-acre recreational area managed by the Tennessee Valley Authority. West of the Land Between the Lakes is Kentucky Lake, paralleling Lake Barkley. The two lakes are joined at their northern ends by a navigation canal.

Corps of Engineers personnel at the project area include a Resource Manager, Assistant Resource Manager, five park rangers, a Maintenance Supervisor, maintenance crew, and crews at the lock, dam, and power house. Gate attendant responsibilities and some maintenance (such as trash pick-up and grass mowing) are carried out on a contract basis.

Topography

The topography of the land surrounding the lake varies from gently rolling hills to steep hills.

Climate

Temperatures range from the upper 80 degrees F. (with extremes to over 100 degrees F.) in the summer to the upper 20 degrees F. (with extremes to below -10 degrees F.) in the winter. The average annual temperature is 58 degrees F. There is an annual average of 44 inches of rain and 12 inches of snow. Prevailing winds come from the northwest at about 10 mph in winter and from the southwest at about seven mph in summer. Throughout the year, 60 percent of the days are sunny, but in the summer months the rate increases to 70 percent.

Soils and vegetation

Bottomlands consist primarily of moderately well-drained, alluvial soils. The less fertile hillsides consist of moderately- to well-drained soils.

Vegetation on the project's open lands ranges from grazing pastures and hayfields (these lands are still under lease for agricultural purposes) to a dense cover of herbaceous and woody plants including blackberry, wildrose, honeysuckle, and box elder. Forested areas are composed of mainly the mixed oak-hickory type of cover, although yellow poplar, walnut, American elm, white ash, green oak, and American beech also exist. The understory consists of dogwood, sourwood, redbud, black cherry, western red cedar, and persimmon.

Fish and wildlife

Crappie, rockfish, blue and channel catfish, largemouth, black, and striped bass, bluegill and other sunfish, and sauger are the major species of fish found in Lake Barkley.

When planned wildlife management programs are initiated, the wildlife inhabiting the lake area will include deer, racoon, rabbit, gray squirrel, and other small upland game and non-game species. Various types of water fowl, mourning doves, and upland game birds such as bob-white quail, and turkey will also benefit from the forest and wildlife management programs.

Population areas served and accessibility

Much of the area surrounding the project is rural. However, within a 150-mile radius of the lake are the cities of Louisville, Kentucky, Nashville, Memphis, and Clarksville, Tennessee, St. Louis, Missouri, and Evansville, Indiana. The project is accessible to both local and regional traffic by a system of federal, state, and county highways.

Recreation areas

The Lake Barkley Project Area contains 3935 acres of developed recreational land. The Corps manages 23 multiple-use areas which occupy approximately 2000 acres. Six commercial marinas occupy 206 acres; Lake Barkley State Resort Park (State of Kentucky) accounts for 1700 acres; the City of Clarksville, Tennessee operates two parks of 35 acres; and the City of New Providence, Tennessee operates a 30-acre park. The Cross Creeks National Wildlife Refuge of the Fish and Wildlife Service (U. S. Department of the Interior) is located nearby.

Access to the water is easily accomplished along most of the lake's shoreline. Best access is at the 37 Corps recreation points (14 of which consist of a boat ramp and parking area). Activities available at Corps and/or other public or private areas are: camping, boating, hiking, picnicking, cycling, horseback riding, boat fishing, shore fishing, hunting, waterskiing, and amphitheater and interpretive program participation. Corps support facilities include a visitor center, restroom and shower buildings, picnic shelters, boat launching ramps, and electric service, water service, and dumping stations at campgrounds.

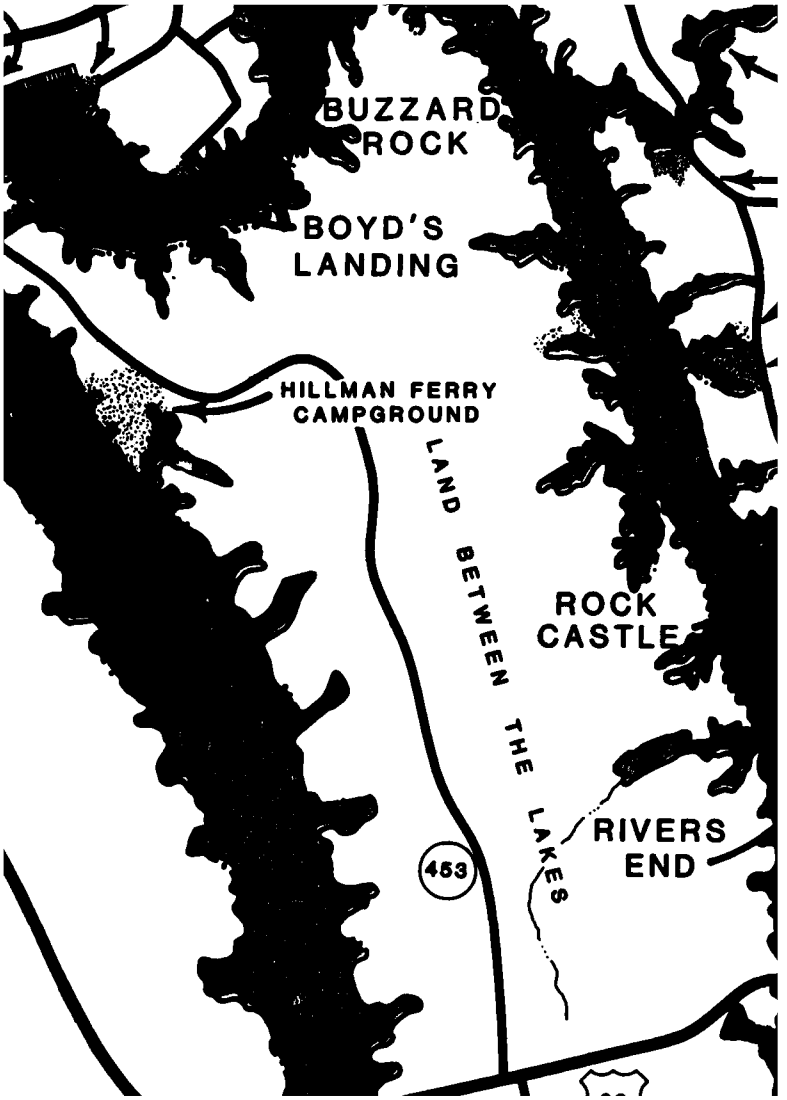
Visitation

In 1978, 5,395,900 recreation days were recorded at Lake Barkley. June was the month of highest visitation, with 1,011,900 recreational days reported.

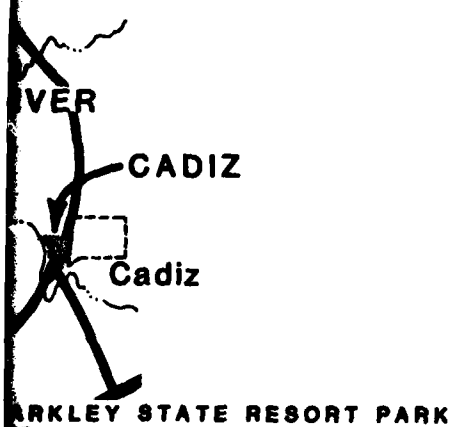
In accordance with letter from DAEN-RDC, DAEN-ASI dated 22 July 1977, Subject: Facsimile Catalog Cards for Laboratory Technical Publications, a facsimile catalog card in Library of Congress MARC format is reproduced below.

Urban Research & Development Corporation.
Recreation carrying capacity facts and considerations; Report 1: Barkley Lock and Dam, Lake Barkley Project Area / by Urban Research and Development Corporation, Bethlehem, Pa. Vicksburg, Miss. : U. S. Waterways Experiment Station ; Springfield, Va. : available from National Technical Information Service, 1980.
iv, 77, [25] p. : ill. ; 27 cm. (Miscellaneous paper - U. S. Army Engineer Waterways Experiment Station ; R-80-1, Report 1)
Prepared for Office, Chief of Engineers, U. S. Army, Washington, D. C., under Contract No. DACW39-78-C-0096.
Project map of Lake Barkley in pocket at end of report.

1. Barkley Lake Project. 2. Carrying capacity. 3. Monitoring. 4. Overcrowding. 5. Recreation. 6. Recreation resource planning. 7. Recreational areas. 8. Recreational facilities. 9. Utilization. I. United States. Army. Corps of Engineers. II. Series: United States. Waterways Experiment Station, Vicksburg, Miss. Miscellaneous paper ; R-80-1, Report 1.
TA7.W34m no.R-80-1 Report 1


BUZZARD ROCK
BOYD'S LANDING
HILLMAN FERRY CAMPGROUND
LAND BETWEEN THE LAKES
ROCK CASTLE
RIVERS END
453

ake Barkley, Kentucky and Tennessee



W

EEK

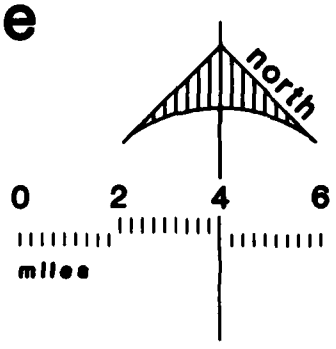
184

CORPS OF ENGINEERS RECREATION AREAS					
CANAL	●	O	●	O	●
DAMSITE		●			●
EUREKA	●	●	●	●	●
GRAND RIVERS	●	O	●	O	●
KUTTAWA	O	O			O
LAKE BARKLEY	O				●

O denotes activity offered in r
● denotes interviews conducte

Corps recreation area
other recreation area
government-owned land
municipal boundary

ucky and Tennessee



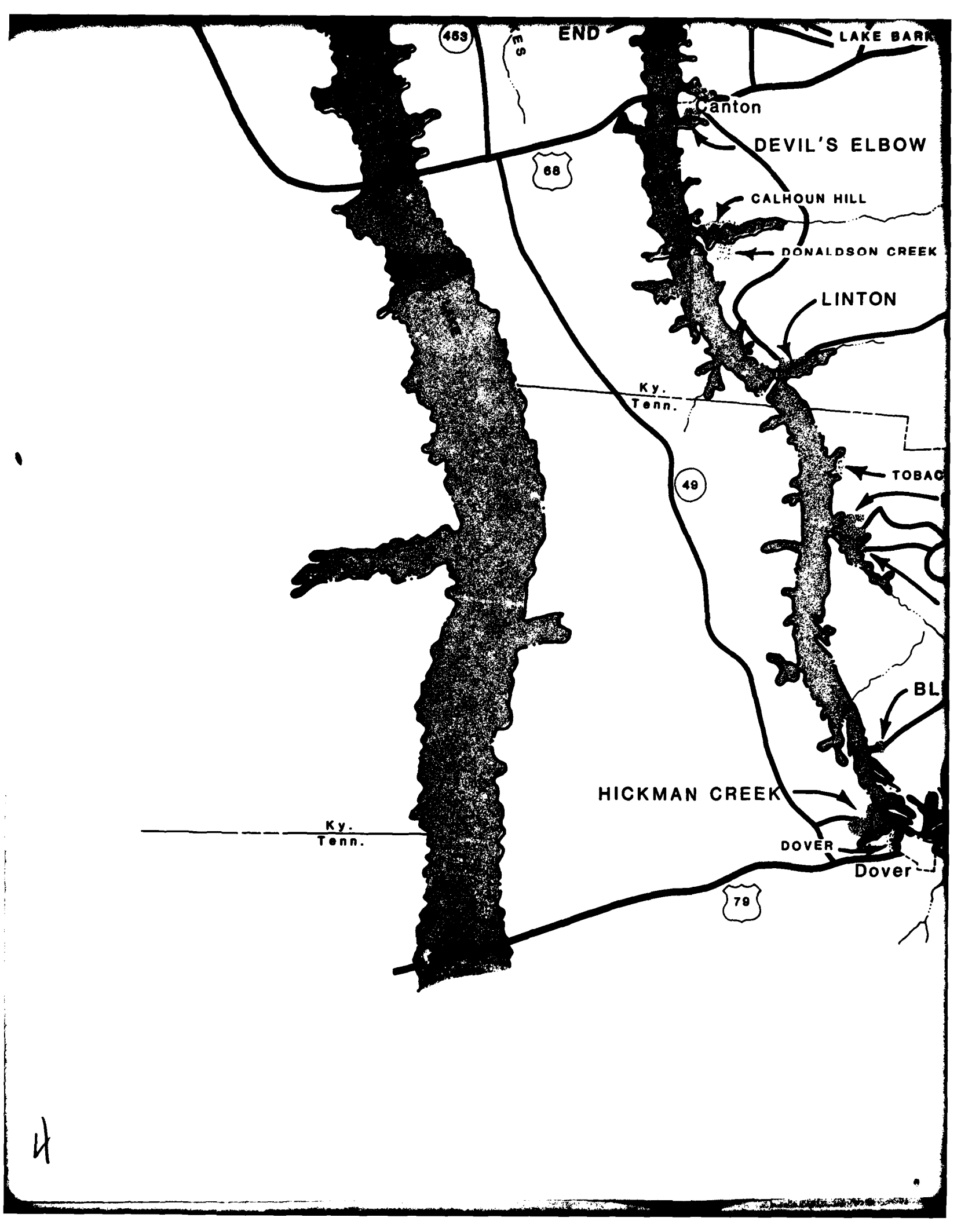
CORPS OF ENGINEERS RECREATION AREAS										
CANAL	●	O	●	O	●		●		●	●
DAMSITE		●			●			O		
EUREKA	●	●	●	●	●			●	O	O
GRAND RIVERS	●	O	●	O	●			●	●	O
KUTTAWA	O	O			O	O		●	●	O
LAKE BARKLEY	O				●					O

O denotes activity offered in recreation area

● denotes interviews conducted in activity area

Corps recreation area
other recreation area
government-owned land
municipal boundary

dam
lake shoreline
highway
secondary road


463
END
LAKE BARK
Canton
DEVIL'S ELBOW
68
CALHOUN HILL
DONALDSON CREEK
LINTON
Ky.
Tenn.
49
TOBAC
BL
HICKMAN CREEK
Ky.
Tenn.
DOVER
Dover
79

4


ELBOW
ILL
SON CREEK
NTON
164
139
TOBACCO PORT
BUMPUS MILLS
SALINE CREEK
BLUE CREEK
DYERS CREEK
Dover
LICK CREEK
49
RIVERS BEND
Cumberland R.
OLD LOCK C
149
79
NEW PROVIDENCE
SMITH BRANCH
CORPS OF ENGINEERS RECREATION AREAS
CANAL
DAMSITE
EUREKA
GRAND RIVERS
KUTTAWA
LAKE BARKLEY
O denotes activity offered
● denotes interviews cond
Corps recreation area
other recreation area
government-owned land
municipal boundary
prepared by Urban Research and Develo

CORPS OF ENGINEERS RECREATION AREAS										
CANAL	●	O	●	O	●		●		●	●
DAMSITE		●			●			O		
EUREKA	●	●	●	●	●			●	O	O
GRAND RIVERS	●	O	●	O	●			●	●	O
KUTTAWA	O	O			O	O		●	●	O
LAKE BARKLEY	O				●					O

O denotes activity offered in recreation area

● denotes interviews conducted in activity area

Corps recreation area
other recreation area
government-owned land
municipal boundary

dam
lake shoreline
highway
secondary road

prepared by Urban Research and Development Corporation - Bethlehem, Pa.