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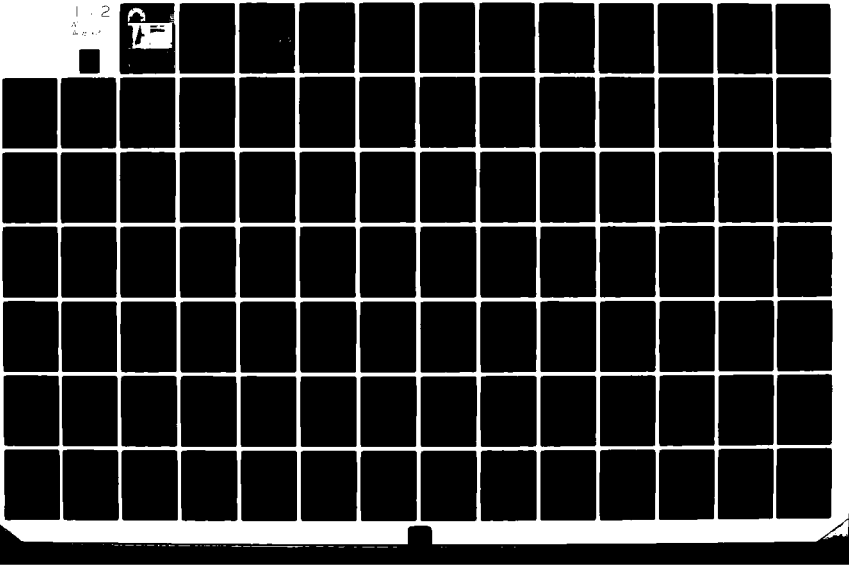

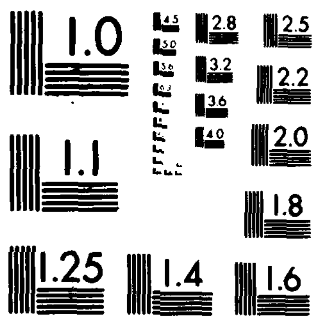

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RECREATION CARRYING CAPACITY FACTS AND CONSIDERATIONS

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HARTWELL LAKE PROJECT AREA

by

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

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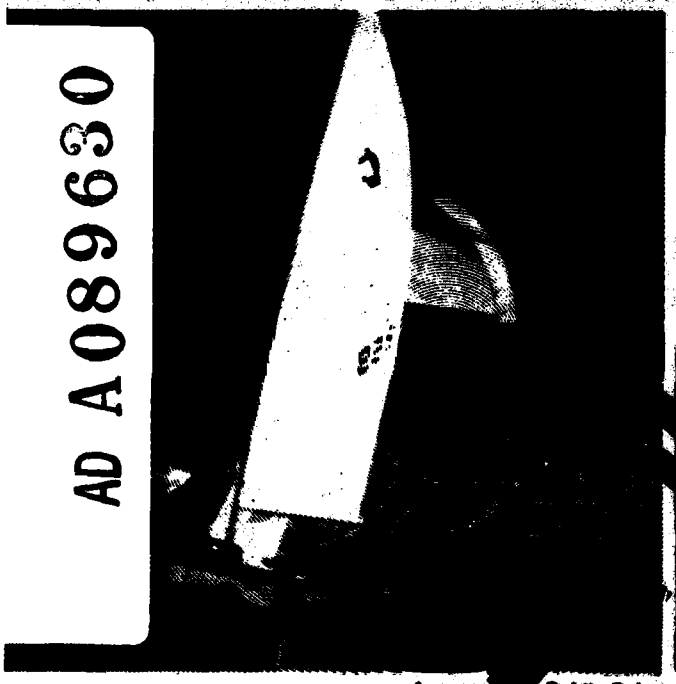

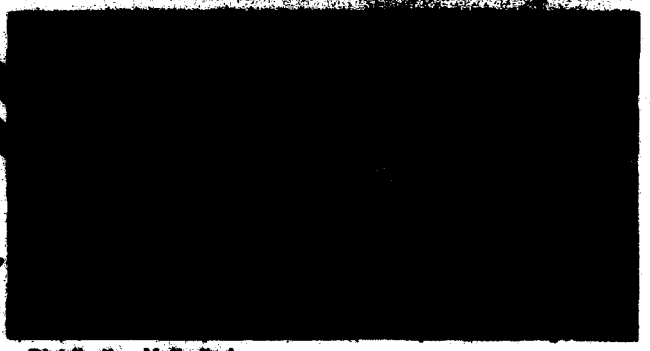

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RECREATION CARRYING CAPACITY FACTS AND [illegible]

Title	[illegible]
Report 1: Barkley Lock and Dam, Lake Barkley Project Area	[illegible]
Report 2: Benbrook Lake Project Area	[illegible]
Report 3: Hartwell Lake Project Area	[illegible]
Report 4: Lake Ouachita Project Area	[illegible]
Report 5: Lake Shelbyville Project Area	[illegible]
Report 6: McNary Lock and Dam, Lake Wallula Project Area	[illegible]
Report 7: Milford Lake Project Area	[illegible]
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Report 9: Shenango River Lake Project Area	[illegible]
Report 10: Somerville Lake Project Area	[illegible]
Report 11: Surry Mountain Lake Project Area	[illegible]

Acknowledgements

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

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18. SUPPLEMENTARY NOTES

A project map of Hartwell Lake 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)

Hartwell 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 Hartwell Lake Project. The information is based upon: 1) user and management surveys conducted at Hartwell Lake, 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.

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PREFACE

This report presents the findings and recommendations of the Urban Research and Development Corporation (URDC) relative to recreational carrying capacity at the Hartwell Lake 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

HARTWELL LAKE PROJECT AREA

PART 1: INTRODUCTION

This Report

Purpose

This report, prepared as the third 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 Hartwell Lake Project Area which cannot be found in the Technical Report. The information is based upon: 1) the user and management surveys conducted at Hartwell Lake, 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 19-21, 1978 and the User Survey conducted on June 22-25, 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 Hartwell Lake. 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.

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

Summary Project Area Description*

Hartwell Lake** was authorized for the purposes of flood control and hydroelectric power generation. Located about midway between Charlotte, South Carolina and Atlanta, Georgia, the lake is in a region of rapidly growing population. This very large lake of 55,950 acres[§] has over 200 access points along the 962 mile shoreline and a total project area of over 80,000 acres. The Tugaloo arm of the lake is 49 miles long; the Seneca arm of the lake is 45 miles long. The Corps administers a narrow strip of land (averaging 200 feet in width) around the shoreline.

It is one of the most heavily used Corps lakes in the nation with a 1978 visitation of 11,420,500 recreation days, more than double that of the next highest lake studied. The topography around the reservoir is rugged, with slopes varying between five percent to over 25 percent in the upper reaches of the reservoir. Cut-over mixed pine and upland hardwood forests predominate. The climate is mild, with normal summer temperatures in the middle 80's (degrees F), and annual precipitation consists of 48 inches of rain and two inches of snow. Primary access to the project is via I-85. Encircling the reservoir and connecting with I-85 are numerous primary and secondary roads.

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* 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 activities at Hartwell. The lake's many islands, coves, and inlets are quite popular with boaters and picnickers. The water areas near ramps, marinas, and recreation areas receive heavy use, and the narrow configuration of portions of the lake result in areas where nodal carrying capacity problems exist. There are over 4000 private docks on the lake which make carrying capacity control and management unusually difficult. In some areas severe shoreline erosion exists; riprapping and bulk-heading are being used to stabilize this problem. Some user conflicts on the lake surface occur between sailboats and power boats, and between boaters and swimmers.

The findings presented in the remainder of this section are based on the User Survey. This survey obtained 24 responses from boaters and waterskiers at Hartwell Lake.

User characteristics

Table 1 indicates the characteristics of the boaters and waterskiers surveyed at Hartwell. The most significant differences in the characteristics of the boaters and waterskiers surveyed at Hartwell from those of other study project areas are the relatively large number coming from nearby areas and the relatively large proportion of power boats.

Table 1

Boater and Waterskier Characteristics

Age	Percent of Boaters/Waterskiers	Group Size	Percent of Boaters/Waterskiers
<18	21*	1	0
18 - 25	42*	2	8**
26 - 40	21	3 - 4	46
41 - 55	17	5 - 8	33
56 - 65	0	9 - 12	13
>65	0	>12	0

Travel Time to Project Area	Percent of Boaters/Waterskiers	Visit Duration	Percent of Boaters/Waterskiers
<15 minutes	25	1 - 4 hours	38
15 - 30 minutes	17	5 - 8 hours	46
30 - 60 minutes	42*	1 day	8
1 - 2 hours	4**	2 days	4
2 - 3 hours	13**	3 days	0
3 - 5 hours	0	4 days	0
>5 hours	0	5 - 7 days	0
		>7 days	4

No. of Other Activities	Percent of Boaters/Waterskiers	Equipment	Percent of Boaters/Waterskiers
0	17	Sailboat	5**
1	13	Canoe/Rowboat	0**
2	17	Power Boat	
3	21	(>25 h.p.)	95
4	17		
5	8		
6	8		
>6	0		

*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 Hartwell and elsewhere prefer.

Table 2

Preferred Distance Responses*

Sample	Sample Size	Range	Mean	Median	Mode
All Boaters Surveyed	135	30- a	531	300	300
Hartwell Lake	4	50-300	275	300	300
All Waterskiers Surveyed	95	30- a	520	300	300
Hartwell Lake	16	100-1500	431	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%
Hartwell Lake	75	0	100	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%
Hartwell Lake	100	19	56	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.

Reasons for pleasant/unpleasant experience - Table 4 indicates the impact that different factors had on making the boating or waterskiing experience pleasant or unpleasant for users at Hartwell Lake. Distance from other people, amount/convenience of facilities, people being in areas where they shouldn't be, and car parking facilities were the factors most often cited as being unpleasant. None of these factors was so unpleasant as to cause a surveyed user to indicate that he would not return to the lake.

Tables 5 and 6 indicate the changes in the physical condition and people's use of the area reported by boaters and waterskiers from their previous visit.

Table 5

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

Area	Positive Changes	Negative Changes
Lake and Adjacent Areas	"Gate house" (1) "More development" (1)	"Shoreline erosion" (1)

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

Table 6

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

Area	Positive Changes	Negative Changes
Lake and Adjacent Areas	"More people" (1)	"More boats" (2)

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
Hartwell Lake

Reasons	Percentage* of Users Responding:		
	Pleasant	Unplessant	Not Important
General Reasons			
Characteristics and behavior of other people	88	4	4
Distance from other people	63	38	
Number of people in other visitor groups	71	13	8
Number and type of other activities occurring here	83	13	4
Scenic views	92	-	8
Noise	71	4	21
Accidents or near accidents	83	13	-
Enforcement of rules/regulations	83	17	-
Car parking facilities	75	21	-
Theft	83	13	-
Vandalism	79	17	-
Land-Based Reasons			
Amount of facilities (restrooms, water, etc.)	61	33	-
Convenience to facilities (restrooms, water, etc.)	72	22	-
Maintenance of facilities	94	-	-
Condition of trees and landscape	89	6	-
Condition of grass or soil	83	11	-
Water-Based Reasons			
Water quality	83	17	-
Formal designation of places for your activity	50	-	-
Waiting time to launch boat	57	4	-
People in areas they shouldn't be	63	29	4

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

Acceptability of techniques - Table 7 indicates the acceptability of different techniques for solving problems to the boaters and water-skiers surveyed at Hartwell Lake.

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 8 of the 17 techniques. However, even for those techniques which were acceptable to most respondents, up to 42 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 7

User Acceptability of Techniques--Boating/Waterskiing
Hartwell Lake

Techniques	Levels of Acceptability Percentage* of Users Responding:		
	Very Acceptable	Mildly Acceptable	Unacceptable
General Planning Techniques			
Keep major recreation areas more separated	46	13	21
Make vehicle access to areas less convenient	8	8	79
Make area's existence less obvious	29	8	58
Site Planning Techniques			
Design for greater distance between people	17	4	8
Reduce number of parking spaces	38	8	54
Management Techniques			
Procedures:			
Require prior reservations	-	17	83
Require permits	17	25	58
Charge/increase fees	17	17	67
Rules and Regulations:			
Impose more rules	8	8	83
Provide stricter enforcement of rules	29	17	54
Close areas when natural resource destruction reaches critical point	79	13	8
Close areas when they become "too full"	63	17	20
Reduce number of activities in same area	42	8	42
Keep unnecessary vehicles out	63	8	4
Services:			
Provide more and better information	67	25	8
Increase maintenance and restoration	25	13	-
Reduce facilities and services	17	25	58

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

BOAT FISHING

Orientation

Sport fishing is a major attraction at Hartwell Lake. During the User Survey, interviews with boat fishermen were conducted on the lake surface in the general area between the Oconee Point and Twelve Mile recreation areas. Some user conflicts were observed between boaters and boat fishermen.

The findings presented in the remainder of this section are based on the User Survey. This survey obtained 15 responses from boat fishermen at Hartwell Lake.

User characteristics

Table 8 indicates the characteristics of the boat fishermen surveyed at Hartwell. The most significant differences in the characteristics of the boat fishermen surveyed at Hartwell from those of other study project areas are the relatively smaller typical group size and the relatively fewer fishermen participating in other activities.

Table 8

Boat Fisherman Characteristics

Age	Percent of Boat Fishermen	Group Size	Percent of Boat Fishermen
<18	7	1	13
18 - 25	13	2	53
26 - 40	27	3 - 4	27**
41 - 55	40	5 - 8	7**
56 - 65	7	9 - 12	0
>65	7	>12	0

Travel Time to Project Area	Percent of Boat Fishermen	Visit Duration	Percent of Boat Fishermen
<15 minutes	13	1 - 4 hours	27
15 - 30 minutes	33	5 - 8 hours	67
30 - 60 minutes	27	1 day	0
1 - 2 hours	13	2 days	0
2 - 3 hours	13	3 days	0
3 - 5 hours	0	4 days	0
>5 hours	0	5 - 7 days	7
		>7 days	0

No. of Other Activities	Percent of Boat Fishermen	Equipment	Percent of Boat Fishermen
0	60*	Power Boat	
1	20	(>25 h.p.)	100
2	13**		
3	0**		
4	0		
5	7		
6	0		
>6	0		

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

User opinions

Spacing preferences - Tables 9 and 10 indicate the spacing that the boat fishermen surveyed at Hartwell and elsewhere prefer.

Table 9

Preferred Distance Responses*

Sample	Sample Size	Range	Mean	Median	Mode
All Boat Fishermen Surveyed	111	30 - 5280	555	200	100
Hartwell Lake	14	100 - 1500	765	750	1500

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

Table 10

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%
Hartwell Lake	100	21	14	64

*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.

Significantly more boat fishermen at Hartwell prefer group C spacing than at the other study project areas.

Reasons for pleasant/unpleasant experience - Table 11 indicates the impact that different factors had on making the boat fishing experience pleasant or unpleasant for users at Hartwell. "Catching fish," "convenience to facilities," and "distance from other people," were the factors which most often made the experience at Hartwell unpleasant. None of these factors was so unpleasant as to cause a boat fisherman to indicate that he would not return.

Tables 12 and 13 indicate the changes in the physical condition and people's use of the area by boat fishermen from their previous visit.

Table 12

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	"Gate" (1)	(None mentioned)

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

Table 13

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 Areas	"Cleaner" (1) "More bass fishermen" (1)	(None mentioned)

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

Table 11

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

Reasons	Percentage* of Users Responding:		
	Pleasant	Unpleasant	Not Important
General Reasons			
Characteristics and behavior of other people	93	7	-
Distance from other people	80	20	-
Number of people in other visitor groups	93	7	-
Number and type of other activities occurring here	93	7	-
Scenic views	100	-	-
Noise	93	-	7
Accidents or near accidents	87	13	-
Enforcement of rules/regulations	100	-	-
Car parking facilities	80	13	7
Theft	93	-	7
Vandalism	93	-	7
Land-Based Reasons			
Visual privacy from other people	33	-	60
Amount of facilities (restrooms, water, etc.)	87	13	-
Convenience to facilities (restrooms, water, etc.)	73	27	-
Maintenance of facilities	100	-	-
Condition of trees and landscape	100	-	-
Condition of grass or soil	100	-	-
Water-Based Reasons			
Water quality	100	-	-
Catching fish	53	33	-
People in areas they shouldn't be	93	7	-

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

Acceptability of techniques - Table 14 indicates the acceptability of different techniques for solving problems to the boat fishermen surveyed at Hartwell.

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 17 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 14

User Acceptability of Techniques--Boat Fishing
Hartwell Lake

Techniques	Levels of Acceptability Percentage* of Users Responding:		
	Very Acceptable	Mildly Acceptable	Unacceptable
General Planning Techniques			
Keep major recreation areas more separated	73	20	7
Make vehicle access to areas less convenient	47	27	27
Make area's existence less obvious	20	60	20
Site Planning Techniques			
Reduce number of parking spaces	53	-	47
Management Techniques			
Procedures:			
Require prior reservations	27	13	60
Require permits	13	27	60
Charge/increase fees	21	-	79
Rules and Regulations:			
Impose more rules	53	-	47
Provide stricter enforcement of rules	60	27	13
Close areas when natural resource destruction reaches critical point	73	13	13
Close areas when they become "too full"	43	36	21
Reduce number of activities in same area	73	20	7
Limit number of people in visitor groups	7	-	53
Keep unnecessary vehicles out	93	7	-
Services:			
Provide more and better information	100	-	-
Increase maintenance and restoration	93	7	-
Reduce facilities and services	33	-	67

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

BOAT LAUNCHING

Orientation

The Corps ramps are dispersed around the lake, have a high level of development, and each contains only one launching lane. During the User Survey, overcrowding and congestion were observed.

The findings presented in the remainder of this section are based on the User Survey. This survey obtained 17 responses from boat launchers at Twelve Mile Recreation Area.

User characteristics

Table 15 indicates the characteristics of the boat launchers surveyed at Hartwell. The most significant differences in the characteristics of the boat launchers surveyed at Hartwell from those of other study project areas are the relatively smaller group size and the relatively shorter travel times.

Table 15

Boat Launcher Characteristics

Age	Percent of Boat Launchers	Group Size	Percent of Boat Launchers
<18	0	1	0
18 - 25	24	2	47*
26 - 40	35	3 - 4	41
41 - 55	41	5 - 8	12
56 - 65	0	9 - 12	0**
>65	0	>12	0

Travel Time to Project Area	Percent of Boat Launchers	Visit Duration	Percent of Boat Launchers
<15 minutes	18	1 - 4 hours	24
15 - 30 minutes	47*	5 - 8 hours	76
30 - 60 minutes	24	>8 hours	0
1 - 2 hours	12**		
2 - 3 hours	0		
3 - 5 hours	0		
>5 hours	0		

No. of Other Activities	Percent of Boat Launchers
0	59*
1	29
2	6
3	6
4	0
5	0
6	0
>6	0

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

User opinions

Launch time preferences - The launching times boat launchers surveyed at Hartwell preferred ranged from 5 to 20 minutes, with the average time being 7 minutes.

Reasons for pleasant/unpleasant experience - Table 16 indicates the impact that different factors had on making the boat launching experience pleasant or unpleasant for users at the Twelve Mile Ramp. "Car parking facilities," "waiting time to launch," and "characteristics and behavior of others" were the factors which most often made the experience at Twelve Mile unpleasant. None of the boat launchers surveyed indicated that he would not return to the area. No changes in the physical condition or people's use of the area were reported by boat launchers from their previous visit.

Table 16

Reasons Making Recreation Experience Pleasant or Unpleasant--Boat Launching Twelve Mile Ramp

Reasons	Percentage* of Users Responding:		
	Pleasant	Unpleasant	Not Important
General Reasons			
Characteristics and behavior of other people	82	18	-
Distance from other people	41	-	18
Number of people in other visitor groups	35	-	65
Number and type of other activities occurring here	71	-	29
Scenic views	53	-	47
Noise	35	-	65
Accidents or near accidents	100	-	-
Enforcement of rules/regulations	100	-	-
Car parking facilities	18	71	12
Theft	82	12	6
Vandalism	82	12	6
Land-Based Reasons			
Amount of facilities (restrooms, water, etc.)	100	-	-
Convenience to facilities (restrooms, water, etc.)	100	-	-
Steepness of slopes	100	-	-
Maintenance of facilities	100	-	-
Condition of trees and landscape	82	-	18
Condition of grass or soil	82	-	18
Water-Based Reasons			
Water quality	100	-	-
Formal designation of places for your activity	6	-	-
Waiting time to launch boat	82	18	-
People in areas they shouldn't be	82	6	-

*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 launcher surveyed at Hartwell.

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 31 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
Hartwell Lake

Techniques	Levels of Acceptability Percentage* of Users Responding:		
	Very Acceptable	Mildly Acceptable	Unacceptable
General Planning Techniques			
Keep major recreation areas more separated	18	53	29
Make vehicle access to areas less convenient	-	12	88
Make area's existence less obvious	-	12	88
Site Planning Techniques			
Redesign area to accommodate fewer users	44	25	31
Design for greater distance between people	6	6	6
Reduce number of parking spaces	71	12	18
Management Techniques			
Procedures:			
Require prior reservations	-	-	100
Require permits	-	-	100
Charge/increase fees	6	18	76
Rules and Regulations:			
Impose more rules	71	6	25
Provide stricter enforcement of rules	88	12	-
Close areas when natural resource destruction reaches critical point	71	18	12
Close areas when they become "too full"	77	24	-
Reduce number of activities in same area	41	47	12
Limit number of people in visitor groups	-	-	100
Keep unnecessary vehicles out	100	-	-
Services:			
Provide more and better information	94	6	-
Increase maintenance and restoration	94	6	-
Reduce facilities and services	-	-	100

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

CAMPING

Orientation

Twenty of the 68 recreation areas at Hartwell provide for tent and trailer camping. The level of development and level of control at the campgrounds are high, although there are no electric hookups at any of the Corps-managed campgrounds. Contracted gate attendants are used at some campgrounds and some impact sites (25' x 25') have recently been put in the Watsaddlers Campground to prevent overuse. Most of the campers interviewed during the User Survey responded that the distance that the campsites were spaced is just right; however, approximately 25 percent of the Asbury Campers responded that the distance between campers was "too close."

The findings presented in the remainder of this section are based on the User Survey. This survey obtained 96 responses from campers at Hartwell (16 at Asbury, 17 at Crescent, 19 at Milltown, 30 at Oconee, and 14 at Watsaddlers).

User characteristics

Table 18 indicates the characteristics of the campers surveyed at Hartwell. The most significant difference in the characteristics of the campers surveyed at Hartwell from those of other study project areas is the shorter travel times.

Table 18

Camper Characteristics

Age	Percent of Campers	Group Size	Percent of Campers
<18	3	1	3**
18 - 25	18	2	11**
26 - 40	52	3 - 4	43
41 - 55	17	5 - 8	38
56 - 65	5**	9 - 12	3
>65	5**	>12	2

Travel Time to Project Area	Percent of Campers	Visit Duration	Percent of Campers
<15 minutes	7	1 - 4 hours	0
15 - 30 minutes	23*	5 - 8 hours	0
30 - 60 minutes	43*	1 day	6
1 - 2 hours	17**	2 days	31
2 - 3 hours	6**	3 days	23
3 - 5 hours	2**	4 days	7
>5 hours	2**	5 - 7 days	21
		>7 days	11

No. of Other Activities	Percent of Campers	Equipment	Percent of Campers
0	2	Tent	34
1	5	Tent Camper	7
2	5	Truck Camper	12
3	18	Trailer	40
4	17	Van	2
5	18	Motor Home	4
6	18		
>6	18		

*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 Hartwell 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
Hartwell	68	50 - a	77	75	75
Asbury	11	70 -300	79	75	75,80
Crescent	13	60 -150	82	75	75
Milltown	11	50 - a	70	75	-
Oconee	25	50 -150	74	75	75
Watsaddlers	8	60 - a	84	80	100

*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%
Hartwell	87	0	10	56	33
Asbury	73	0	0	50	50
Crescent	85	0	9	55	36
Milltown	82	0	22	44	33
Oconee	92	0	13	70	17
Watsaddlers	100	0	0	38	63

*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.

While the preferences of campers at the 5 areas differ from each other, campers at Hartwell tend to prefer greater spacing more frequently than campers in the total survey sample.

Reasons for pleasant/unpleasant experience - Tables 21, 22, 23, 24, and 25 indicate the impact that different factors had on making the camping experience pleasant or unpleasant for users at the five areas surveyed. While the responses of the campers surveyed vary from one area to another, campers at all of the areas found their experience to be generally pleasant. The amount/convenience of facilities were the factors which caused unpleasantness in a significant number of cases at all five areas. Table 26 indicates the number of campers who indicated thay they would not return to each area and their reasons.

Tables 27 and 28 indicate the changes in the physical condition and people's use of the areas reported by campers from their previous visit.

Table 21

Reasons Making Recreation Experience Pleasant or Unpleasant--Camping
Asbury

Reasons	Percentage* of Users Responding:		
	Pleasant	Unpleasant	Not Important
General Reasons			
Characteristics and behavior of other people	100	-	-
Distance from other people	93	-	7
Number of people in other visitor groups	93	-	7
Number and type of other activities occurring here	73	7	20
Fees charged	94	6	-
Scenic views	94	6	-
Noise	88	13	-
Accidents or near accidents	100	-	-
Enforcement of rules/regulations	94	6	-
Car parking facilities	81	19	-
Theft	100	-	-
Vandalism	100	-	-
Land-Based Reasons			
Visual privacy from other people	75	25	-
Amount of facilities (restrooms, water, etc.)	44	56	-
Convenience to facilities (restrooms, water, etc.)	38	63	-
Nearness to the water body	100	-	-
Steepness of slopes	81	-	-
Maintenance of facilities	81	-	-
Condition of trees and landscape	88	-	-
Condition of grass or soil	94	-	-
Water-Based Reasons			
Water quality	100	-	-

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

Table 22

Reasons Making Recreation Experience Pleasant or Unpleasant--Camping
Crescent

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	94	-	-
Number and type of other activities occurring here	82	6	6
Fees charged	88	12	-
Scenic views	94	-	6
Noise	100	-	-
Accidents or near accidents	94		-
Enforcement of rules/regulations	94	6	-
Car parking facilities	94	6	-
Theft	94	-	-
Vandalism	94	-	-
Land-Based Reasons			
Visual privacy from other people	88	12	-
Amount of facilities (restrooms, water, etc.)	53	47	-
Convenience to facilities (restrooms, water, etc.)	59	41	-
Nearness to the water body	100	-	-
Steepness of slopes	82	18	-
Maintenance of facilities	94	6	-
Condition of trees and landscape	100	-	-
Condition of grass or soil	100	-	-
Water-Based Reasons			
Water quality	100	-	-

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

Table 23

Reasons Making Recreation Experience Pleasant or Unpleasant--Camping
Milltown

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	84	5	11
Number and type of other activities occurring here	68	5	21
Fees charged	95	5	-
Scenic views	100	-	-
Noise	100	-	-
Accidents or near accidents	74	-	-
Enforcement of rules/regulations	100	-	-
Car parking facilities	100	-	-
Theft	95	-	-
Vandalism	95	-	-
Land-Based Reasons			
Visual privacy from other people	95	5	-
Amount of facilities (restrooms, water, etc.)	79	21	-
Convenience to facilities (restrooms, water, etc.)	95	5	-
Nearness to the water body	100	-	-
Steepness of slopes	95	5	-
Maintenance of facilities	95	5	-
Condition of trees and landscape	100	-	-
Condition of grass or soil	95	5	-
Water-Based Reasons			
Water quality	95	5	-

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

Table 24

Reasons Making Recreation Experience Pleasant or Unpleasant--Camping
Oconee Point

Reasons	Percentage* of Users Responding:		
	Pleasant	Unpleasant	Not Important
General Reasons			
Characteristics and behavior of other people	97	3	-
Distance from other people	100	-	-
Number of people in other visitor groups	87	3	10
Number and type of other activities occurring here	100	-	-
Fees charged	97	3	-
Scenic views	100	-	-
Noise	97	-	3
Accidents or near accidents	93	-	7
Enforcement of rules/regulations	100	-	-
Car parking facilities	100	-	-
Theft	93	-	3
Vandalism	93	-	3
Land-Based Reasons			
Visual privacy from other people	97	-	3
Amount of facilities (restrooms, water, etc.)	60	40	-
Convenience to facilities (restrooms, water, etc.)	70	30	-
Nearness to the water body	100	-	-
Steepness of slopes	100	-	-
Maintenance of facilities	97	3	-
Condition of trees and landscape	100	-	-
Condition of grass or soil	93	7	-
Water-Based Reasons			
Water quality	97	3	-

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

Table 25

Reasons Making Recreation Experience Pleasant or Unpleasant--Camping Watsaddlers

Reasons	Percentage* of Users Responding:		
	Pleasant	Unpleasant	Not Important
General Reasons			
Characteristics and behavior of other people	83	17	-
Distance from other people	79	7	-
Number of people in other visitor groups	86	-	-
Number and type of other activities occurring here	71	7	7
Fees charged	92	-	8
Scenic views	77	8	15
Noise	85	15	-
Accidents or near accidents	69	8	8
Enforcement of rules/regulations	85	8	8
Car parking facilities	92	-	8
Theft	69	8	15
Vandalism	77	-	23
Land-Based Reasons			
Visual privacy from other people	92	8	-
Amount of facilities (restrooms, water, etc.)	62	30	8
Convenience to facilities (restrooms, water, etc.)	77	23	-
Nearness to the water body	100	-	-
Steepness of slopes	92	-	-
Maintenance of facilities	85	15	-
Condition of trees and landscape	92	8	-
Condition of grass or soil	92	8	-
Water-Based Reasons			
Water quality	92	-	-

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

Table 26

Number and Percent of Users That Indicated They Would Not Return to the Activity Area and Their Reasons

Area	Number and percent of users surveyed who indicated they would not return #	%	Reasons for not wanting to return
Asbury	1	6%	"14 day limit too short"
	1	6%	"No showers"
	1	6%	"Can't keep boat at site"
Crescent	-	-	--
Milltown	-	-	--
Oconee	-	-	--
Watsaddlers	1	7%	"Gate attendant rude"
	1	7%	"Noise"

Table 27

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

Area	Positive Changes		Negative Changes	
Asbury	"Quieter"	(2)	"More people"	(1)
			"Litter"	(1)
			"Trespassing on campsites"	(1)
Crescent	"Not as full"	(1)	"More hippies"	(1)
			"Attendant reserves best sites for friends"	(1)
Milltown	"Less crowded"	(1)	(None mentioned)	
Oconee	"Quieter"	(1)	"No trouble"	(1)
	"More families"	(1)	"Patrol"	(1)
	"Friendlier people"	(2)		
	"More people"	(1)		
Watsaddlers	"Less disturbances"	(1)	"More people"	(1)
			"Litter"	(1)

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

Table 28

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

Area	Positive Changes		Negative Changes	
Asbury	"Lantern holder"	(1)	"Trees destroyed"	(1)
	"Cleaner"	(1)	"Lantern poles in wrong place"	(1)
Crescent	"Lantern post"	(4)	"Gate locked too early"	(2)
	"More tables"	(1)	"Visitors can't come in"	(1)
	"Gate attendant"	(7)		
	"Good garbage pickup"	(1)		
	"Cut grass"	(2)		
	"Bathrooms better"	(2)		
Milltown	"Lantern post"	(3)	"Fee"	(1)
	"Better up-keep"	(3)		
	"Showers"	(3)		
	"Gate"	(1)		
	"Programs"	(1)		
	"New campsites"	(1)		
Oconee	"Gate attendant"	(7)	(None mentioned)	
	"Bath House"	(1)		
	"Restrooms nicer"	(1)		
	"Trash cans"	(1)		
	"Lantern posts"	(2)		
	"Water spigots"	(1)		
	"Cleaner water"	(1)		
	"More developed"	(5)		
	"Cleaner"	(3)		
Watsaddlers	"Showers"	(2)	"No garbage pickup"	(1)
	"Gate attendants"	(3)		
	"Maintenance"	(3)		
	"Improved facilities"	(1)		
	"More sites"	(2)		
	"Water fill-ups"	(1)		
	"Parking"	(1)		
	"Steps on site"	(1)		
	"Lantern post"	(1)		

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

Acceptability of techniques - Table 29 indicates the acceptability of different techniques for solving problems to the campers surveyed at Hartwell.

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 14 of the 22 techniques. However, even for those techniques which were acceptable to most respondents, up to 39 percent responded that these techniques were unacceptable. Thus, project managers should expect some expression of opposition to any technique which they employ.

Table 29

User Acceptability of Techniques--Camping
Hartwell Lake

Techniques	Levels of Acceptability		
	Percentage* of Users Responding:		
	Very Acceptable	Mildly Acceptable	Unacceptable
General Planning Techniques			
Keep major recreation areas more separated	64	13	21
Make vehicle access to areas less convenient	20	16	63
Make area's existence less obvious	18	12	66
Site Planning Techniques			
Redesign area to accommodate fewer users	60	14	26
Design for greater distance between people	73	12	14
Reduce number of parking spaces	25	24	49
Change natural surface by hardening	37	13	51
Change natural surface by paving	51	15	34
Provide landscaped buffers	64	11	25
Management Techniques			
Procedures:			
Require prior reservations	21	23	56
Require permits	41	19	39
Charge/increase fees	19	15	67
Rules and Regulations:			
Impose more rules	8	7	83
Provide stricter enforcement of rules	29	20	50
Close areas when natural resource destruction reaches critical point	82	7	8
Close areas when they become "too full"	91	4	5
Reduce number of activities in same area	22	22	55
Limit number of people in visitor groups	28	17	54
Keep unnecessary vehicles out	77	10	11
Services:			
Provide more and better information	79	16	2
Increase maintenance and restoration	76	12	9
Reduce facilities and services	6	4	89

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

PICNICKING

Orientation

Numerous picnic areas are available at Hartwell Lake, some are overused (e.g. Twelve Mile), some are overcrowded (e.g., Long Point), and others are well balanced.

The findings presented in the remainder of this section are based on the User Survey. This survey obtained 40 responses from picnickers at Hartwell (16 at Long Point, 13 at Singing Pines, and 11 at Twelve Mile).

User characteristics

Table 30 indicates the characteristics of the picnickers surveyed at Hartwell. The characteristics of the picnickers surveyed at Hartwell were similar to the picnickers surveyed at other study project areas.

Table 30

Picnicker Characteristics

Age	Percent of Picnickers	Group Size	Percent of Picnickers
<18	6	1	3
18 - 25	26	2	0
26 - 40	35	3 - 4	29
41 - 55	32	5 - 8	32
56 - 65	0	9 - 12	23
>65	0	>12	12

Travel Time to Project Area	Percent of Picnickers	Visit Duration	Percent of Picnickers
<15 minutes	9	1 - 4 hours	32
15 - 30 minutes	47	5 - 8 hours	62
30 - 60 minutes	26	1 day	6
1 - 2 hours	18	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	12
1	9
2	32
3	15
4	26
5	6
6	0
>6	0

User opinions

Spacing preferences - Tables 31 and 32 indicate the spacing that picnickers surveyed at Hartwell and elsewhere prefer.

Table 31

Preferred Distance Responses*

Sample	Sample Size	Range	Mean	Median	Mode
All Picnickers Surveyed	190	1 - a	62	50	50
Hartwell	25	25-100	57	60	50
Long Point	7	40- 70	56	60	-
Singing Pines	7	25-100	65	60	50
Twelve Mile	11	30- 70	52	50	40

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

Table 32

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%
Hartwell	100	4	44	47	12
Long Point	100	0	43	57	0
	100	14	14	29	43
	100	0	64	36	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.

While the preferences of picnickers at the three areas differ from each other, spacing in the range of group A (20-39 feet) is greatly disfavored at all areas.

Reasons for pleasant/unpleasant experience - Tables 33, 34, and 35 indicate the impact that different factors had on making the picnicking experience pleasant or unpleasant for users at the three areas surveyed. Picnickers at Twelve Mile found their experience to be generally the most pleasant, followed by those at Singing Pines, and those at Long Point. The amount/convenience of facilities made the experience at all three areas unpleasant in a significant number of cases. One user indicated that he would not return to the area (see Table 36).

Tables 37 and 38 indicate the changes in the physical condition and people's use of the areas reported by picnickers from their previous visit.

Table 33

Reasons Making Recreation Experience Pleasant or Unpleasant--Picnicking
Long Point

	Percentage* of Users Responding:		
	Pleasant	Unpleasant	Not Important
General Reasons			
Characteristics and behavior of other people	100	-	-
Distance from other people	63	25	13
Number of people in other visitor groups	69	-	25
Number and type of other activities occurring here	88	-	12
Scenic views	100	-	-
Noise	75	19	
Accidents or near accidents	75	6	13
Enforcement of rules/regulations	100	-	-
Car parking facilities	69	25	6
Theft	100	-	-
Vandalism	88	12	-
Land-Based Reasons			
Visual privacy from other people	69	25	6
Amount of facilities (restrooms, water, etc.)	75	25	-
Convenience to facilities (restrooms, water, etc.)	63	36	-
Nearness to the water body	100	-	-
Steepness of slopes	88	13	-
Maintenance of facilities	88	13	-
Condition of trees and landscape	100	-	-
Condition of grass or soil	94	6	-
Water-Based Reasons			
Water quality	94	-	6

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

Table 34

Reasons Making Recreation Experience Pleasant or Unpleasant--Picnicking
Singing Pines

	Percentage* of Users Responding:		
	Pleasant	Unpleasant	Not Important
General Reasons			
Characteristics and behavior of other people	100	-	-
Distance from other people	92	-	8
Number of people in other visitor groups	85	-	15
Number and type of other activities occurring here	92	-	8
Scenic views	100	-	-
Noise	92	8	-
Accidents or near accidents	92	8	-
Enforcement of rules/regulations	100	-	-
Car parking facilities	85	15	-
Theft	92	-	-
Vandalism	92	-	-
Land-Based Reasons			
Visual privacy from other people	100	-	-
Amount of facilities (restrooms, water, etc.)	58	42	-
Convenience to facilities (restrooms, water, etc.)	58	42	-
Nearness to the water body	100	-	-
Steepness of slopes	100	-	-
Maintenance of facilities	92	8	-
Condition of trees and landscape	92	8	-
Condition of grass or soil	92	8	-
Water-Based Reasons			
Water quality	100	-	-

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

Table 35

Reasons Making Recreation Experience Pleasant or Unpleasant--Picnicking
Twelve Mile

	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	82	18	-
Theft	91	9	-
Vandalism	100	-	-
Land-Based Reasons			
Visual privacy from other people	100	-	-
Amount of facilities (restrooms, water, etc.)	82	18	-
Convenience to facilities (restrooms, water, etc.)	82	18	-
Nearness to the water body	100	-	-
Steepness of slopes	73	27	-
Maintenance of facilities	91	-	9
Condition of trees and landscape	64	18	9
Condition of grass or soil	73	18	9
Water-Based Reasons			
Water quality	100	-	-

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

Table 36

Number and Percent of Users That Indicated They Would Not Return to the Activity Area and Their Reasons

Area	Number and percent of users surveyed who indicated they would not return #	%	Reasons for not wanting to return
Long Point	-	-	--
Singing Pines	-	-	--
Twelve Mile	1	9%	"Not a good swimming beach"

Table 37

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

Area	Positive Changes	Negative Changes
Long Point	"Cleaner" (1)	"Grass too high" (1)
	"Grills" (1)	"High water" (1)
	"More trees" (1)	
	"Grass cut" (2)	
	"Put sand in" (1)	
Singing Pines	"Rocks for erosion control" (1)	(None mentioned)
Twelve Mile	"New grills" (1)	"Dirty" (1)
	"Cleaner" (1)	"More erosion" (1)

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

Table 38

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

Area	Positive Changes	Negative Changes
Long Point	(None mentioned)	"More unruliness" (1)
Singing Pines	(None mentioned)	"Messy" (1)
Twelve Mile	(None mentioned)	(None mentioned)

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

Acceptability of techniques - Table 39 indicates the acceptability of different techniques for solving problems to the picnickers surveyed at Hartwell.

The acceptability of most techniques is very clear: at least 60 percent of the respondents agreed on one of the 3 levels of acceptability for 12 of the 22 techniques. But even for those techniques which most respondents found to be acceptable, up to 41 percent found them to be unacceptable. Thus, project management should expect some opposition to any technique used.

Table 39

User Acceptability of Techniques--Picnicking
Hartwell Lake

Techniques	Levels of Acceptability Percentage* of Users Responding:		
	Very Acceptable	Mildly Acceptable	Unacceptable
General Planning Techniques			
Keep major recreation areas more separated	50	29	21
Make vehicle access to areas less convenient	18	18	65
Make area's existence less obvious	12	18	68
Site Planning Techniques			
Redesign area to accommodate fewer users	47	21	32
Design for greater distance between people	71	24	6
Reduce number of parking spaces	44	18	41
Change natural surface by paving	41	27	32
Provide landscaped buffers	38	44	15
Management Techniques			
Procedures:			
Require prior reservations	3	18	79
Require permits	6	9	85
Charge/increase fees	9	24	68
Rules and Regulations:			
Impose more rules	32	18	50
Provide stricter enforcement of rules	59	15	26
Close areas when natural resource destruction reaches critical point	88	12	-
Close areas when they become "too full"	74	18	9
Reduce number of activities in seam area	38	35	26
Limit number of people in visitor groups	26	15	59
Keep unnecessary vehicles out	62	24	15
Services:			
Provide more and better information	74	18	3
Increase maintenance and restoration	77	9	12
Reduce facilities and services	21	6	73

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

SHORELINE FISHING

Orientation

Shoreline fishing is popular at Hartwell, especially at the outlet area just below the dam. Like most study project areas, there appears to be a need for better and safer shoreline fishing access at the outlet. Although piers have been added at the outlet, they are not frequently used by fishermen during low water periods because they are too far from the water. Most fishermen fish from rocks which are submerged during high water periods.

The findings presented in the remainder of this section are based on the User Survey. This survey obtained 14 responses from shoreline fishermen at Hartwell (13 at the Outlet and 1 at Singing Pines).

User characteristics

Table 40 indicates the characteristics of the shoreline fisherman surveyed at Hartwell. The most significant difference in the characteristics of the shoreline fishermen surveyed at Hartwell from those of other study project areas is the relatively longer travel times.

Table 40

Shoreline Fisherman Characteristics

Age	Percent of Shoreline Fishermen	Group Size	Percent of Shoreline Fishermen
<18	21	1	7
18 - 25	7	2	57
26 - 40	43	3 - 4	36
41 - 55	7	5 - 8	0
56 - 65	7	9 - 12	0
>65	14	>12	0

Travel Time to Project Area	Percent of Shoreline Fishermen	Visit Duration	Percent of Shoreline Fishermen
<15 minutes	0**	1 - 4 hours	43
15 - 30 minutes	7**	5 - 8 hours	29
30 - 60 minutes	57	1 day	14
1 - 2 hours	21	2 days	7
2 - 3 hours	7	3 days	7
3 - 5 hours	7	4 days	0
>5 hours	0	5 - 7 days	0
		>7 days	0

No. of Other Activities	Percent of Shoreline Fishermen
0	86
1	0
2	0
3	14
4	0
5	0
6	0
>6	0

**Significantly lower than total survey sample.

User opinions

Spacing preferences - Tables 41 and 42 indicate the spacing that shoreline fishermen at Hartwell and elsewhere prefer.

Table 41

Preferred Distance Responses*

Sample	Sample Size	Range	Mean	Median	Mode
All shoreline fishermen surveyed	106	6 - a	76	35	50
Hartwell	14	6 - a	61	50	100

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

Table 42

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%
Hartwell	45	0	40	0	60

*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 43 and 44 indicate the impact that different factors had on making the shoreline fishing experience pleasant or unpleasant for users at the two areas surveyed. The "amount/convenience of facilities" and "catching fish" were the factors which made the experience at the Outlet unpleasant in a significant number of cases. None of the shoreline fishermen surveyed indicated that they would not return to the area.

Tables 45 and 46 indicate the changes in the physical condition and people's use of the areas reported by shoreline fishermen from their previous visit.

Table 43

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	92	8	-
Number of people in other visitor groups	85	-	15
Number and type of other activities occurring here	62	-	15
Scenic views	92	-	-
Noise	85	15	-
Accidents or near accidents	85	8	8
Enforcement of rules/regulations	85	8	8
Car parking facilities	85	8	8
Theft	92	-	-
Vandalism			
Land-Based Reasons			
Visual privacy from other people	92	-	8
Amount of facilities (restrooms, water, etc.)	54	38	8
Convenience to facilities (restrooms, water, etc.)	54	31	15
Nearness to the water body	54	-	-
Steepness of slopes	85	-	8
Maintenance of facilities	69	15	8
Condition of trees and landscape	92	-	-
Condition of grass or soil	92	-	-
Water-Based Reasons			
Water quality	100	-	-
Catching fish	54	46	-
Formal designation of places for your activity	67	-	-

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

Table 44

Reasons Making Recreation Experience Pleasant or Unpleasant--Shoreline Fishing
Singing Pines

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			
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	100	-	-
Water-Based Reasons			
Water quality	100	-	-
Catching fish	-	100	-
Formal designation of places for your activity			

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

Table 45

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

Area	Positive Changes	Negative Changes
Outlet	(None mentioned)	"Blasted for pipeline" (1)
Singing Pines	(None mentioned)	(None mentioned)

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

Table 46

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

Area	Positive Changes	Negative Changes
Outlet	"More people" (1)	(None mentioned)
Singing Pines	(None mentioned)	(None mentioned)

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

Acceptability of techniques - Table 47 indicates the acceptability of different techniques for solving problems to the shoreline fishermen surveyed at Hartwell.

The acceptability of many techniques is very clear: at least 60 percent of the respondents agreed on one of the 3 levels of acceptability for 10 of the 22 techniques. But even for those techniques which most respondents found to be acceptable, up to 43 percent found them to be unacceptable. Thus, project management should expect some opposition to any technique used.

Table 47

User Acceptability of Techniques--Shoreline Fishermen
Hartwell Lake

Techniques	Levels of Acceptability Percentage* of Users Responding:		
	Very Acceptable	Mildly Acceptable	Unacceptable
General Planning Techniques			
Keep major recreation areas more separated	71	21	7
Make vehicle access to areas less convenient	14	7	79
Make area's existence less obvious	14	14	64
Site Planning Techniques			
Redesign area to accommodate fewer users	25	25	25
Design for greater distance between people	36	21	29
Reduce number of parking spaces	50	7	43
Change natural surface by paving	29	14	57
Provide landscaped buffers	16	-	33
Management Techniques			
Procedures:			
Require prior reservations	-	21	71
Require permits	14	29	57
Charge/increase fees	14	21	57
Rules and Regulations:			
Impose more rules	21	21	57
Provide stricter enforcement of rules	50	21	29
Close areas when natural resource destruction reaches critical point	79	14	-
Close areas when they become "too full"	79	7	14
Reduce number of activities in seam area	50	14	21
Limit number of people in visitor groups	7	14	14
Keep unnecessary vehicles out	86	14	-
Services:			
Provide more and better information	64	14	21
Increase maintenance and restoration	71	14	14
Reduce facilities and services	-	21	71

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

SUNBATHING/SWIMMING

Orientation

While some areas are popular for swimming and sunbathing, they have a limited level of development (without showers, changing rooms, and other major improvements). Long Point and Twelve Mile are very popular, and both are overcrowded and overused.

The findings presented in the remainder of this section are based on the User Survey. This survey obtained 23 responses from sunbathers and swimmers at Hartwell (20 at Long Point, 2 at Oconee and 1 at Twelve Mile).

User characteristics

Table 48 indicates the characteristics of the sunbathers and swimmers surveyed at Hartwell. The most significant difference in the characteristics of the sunbathers/swimmers surveyed at Hartwell from those of other study project areas is the relatively larger group sizes.

Table 48

Sunbather/Swimmer Characteristics

Age	Percent of Sunbathers/Swimmers	Group Size	Percent of Sunbathers/Swimmers
<18	4	1	0**
18 - 25	54	2	29**
26 - 40	42	3 - 4	38
41 - 55	0	5 - 8	29
56 - 65	0	9 - 12	4
>65	0	>12	0

Travel Time to Project Area	Percent of Sunbathers/Swimmers	Visit Duration	Percent of Sunbathers/Swimmers
<15 minutes	21	1 - 4 hours	46
15 - 30 minutes	42	5 - 8 hours	50
30 - 60 minutes	29	1 day	0
1 - 2 hours	4	2 days	4
2 - 3 hours	4	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 Sunbathers/Swimmers
0	0
1	54
2	21
3	0
4	17
5	4
6	4
>6	0

**Significantly lower than total survey sample.

User opinions

Spacing preferences - Tables 49 and 50 indicate the spacing that sunbathers and swimmers surveyed at Hartwell and elsewhere prefer.

Table 49

Preferred Distance Responses*

Sample	Sample Size	Range	Mean	Median	Mode
All Sunbathers surveyed	161	3- a	30	20	15, 20
Hartwell	12	5-120	44	30	30
Long Point	11	5-120	52	40	30
Oconee	0	-	-	-	-
Twelve Mile	1	20	20	20	20
All Swimmers surveyed	120	2-200	25	20	20
Hartwell	8	10-200	59	40	-
Long Point	8	10-200	59	40	-
Oconee	0	-	-	-	-
Twelve Mile	0	-	-	-	-

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

Table 50

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%
Hartwell	58	14	14	43	29
Long Point	55	17	0	50	33
Twelve Mile	100	0	100	0	0
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%
Hartwell	63	20	40	0	40
Long Point	63	20	40	0	40

*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.

Both the sunbathers and swimmers surveyed at Hartwell tend to prefer greater spacing more frequently than the total sample.

Reasons for pleasant/unpleasant experience - Tables 51, 52 and 53 indicate the impact that different factors had on making the sunbathing/swimming experience pleasant or unpleasant for users at the three areas surveyed. The "amount/convenience of facilities" made the experience at all three areas unpleasant in a significant number of cases. None of the users surveyed indicated they would not return to the area.

Tables 54 and 55 indicate the changes in the physical condition and people's use of the areas reported by sunbathers and swimmers from their previous visit.

Table 51

Reasons Making Recreation Experience Pleasant or Unpleasant--Sunbathing/Swimming
Long Point

Reasons	Percentage* of Users Responding:		
	Pleasant	Unpleasant	Not Important
General Reasons			
Characteristics and behavior of other people	75	6	13
Distance from other people	63	19	19
Number of people in other visitor groups	63	6	31
Number and type of other activities occurring here	31	19	31
Scenic views	88	-	6
Noise	69	-	25
Accidents or near accidents	56	19	19
Enforcement of rules/regulations	81	6	6
Car parking facilities	69	25	6
Theft	75	6	6
Vandalism	75	6	6
Land-Based Reasons			
Amount of facilities (restrooms, water, etc.)	75	25	-
Convenience to facilities (restrooms, water, etc.)	69	31	-
Maintenance of facilities	88	13	-
Condition of trees and landscape	88	13	-
Condition of grass or soil	75	25	-
Water-Based Reasons			
Water quality	94	6	-
Formal designation of places for your activity	75	6	19
People in areas they shouldn't be	69	6	19

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

Table 52

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

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	50	50	-
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			
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	50	50	-
Water-Based Reasons			
Water quality	100	-	-
Formal designation of places for your activity			
People in areas they shouldn't be	100	-	-

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

Table 53

Reasons Making Recreation Experience Pleasant or Unpleasant--Sunbathing/Swimming
Twelve Mile

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 Amount of facilities (restrooms, water, etc.)	-	100	-
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	100	-	-
Formal designation of places for your activity			
People in areas they shouldn't be	100	-	-

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

Table 54

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

Area	Positive Changes	Negative Changes
Long Point	"Cleaner" (1) "Grass cut" (4)	(None mentioned)
Oconee	"Better campsites" (1)	(None mentioned)
Twelve Mile	(None mentioned)	(None mentioned)

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

Table 55

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

Area	Positive Changes	Negative Changes
Long Point	"more people" (1)	"Parking citations" (1) "Litter" (1)
Oconee	(None mentioned)	(None mentioned)
Twelve Mile	(None mentioned)	(None mentioned)

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

Acceptability of techniques - Table 56 indicates the acceptability of different techniques for solving problems to the sunbathers/swimmers surveyed at Hartwell.

The acceptability of most techniques is very clear: at least 60 percent of the respondents agreed on one of the 3 levels of acceptability for 11 of the 18 techniques. But even for those techniques which most respondents found to be acceptable, up to 42 percent found them to be unacceptable. Thus, project management should expect some opposition to any technique used.

Table 56

User Acceptability of Techniques--Sunbathing/Swimming
Hartwell Lake

Techniques	Levels of Acceptability Percentage* of Users Responding:		
	Very Acceptable	Mildly Acceptable	Unacceptable
General Planning Techniques			
Keep major recreation areas more separated	50	13	33
Make vehicle access to areas less convenient	29	17	54
Make area's existence less obvious	25	13	63
Site Planning Techniques			
Redesign area to accommodate fewer users	17	30	50
Design for greater distance between people	63	17	21
Reduce number of parking spaces	17	8	71
Management Techniques			
Procedures:			
Require permits	17	8	75
Charge/increase fees	13	13	75
Rules and Regulations:			
Impose more rules	29	8	63
Provide stricter enforcement of rules	42	17	42
Close areas when natural resource destruction reaches critical point	71	8	17
Close areas when they become "too full"	42	8	50
Reduce number of activities in same area	38	13	42
Limit number of people in visitor groups	21	8	71
Keep unnecessary vehicles out	58	17	25
Services:			
Provide more and better information	71	25	4
Increase maintenance and restoration	83	17	-
Reduce facilities and services	21	4	75

*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 Hartwell Lake. 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 57 may not be practical or possible because of management, budget, or other constraints.

Table 57

Analysis of Selected Problems/Situations

Area/Subject	Problem/Situation	Possible Solutions/Techniques
Shoreline erosion	Severe shoreline erosion exists in some areas; the shoreline is extremely sensitive to erosion from boat wakes, foot traffic, and natural wave action.	• continue to stabilize shoreline areas where needed using riprapping, bulkheading, etc. • identify those areas most prone to erosion. • continually look for new ways of preventing and solving shoreline erosion problems.
Long Point and Twelve Mile	Some areas are overused.	• close the most abused areas to allow vegetation to become reestablished. • reseed and fertilize. • consider using impact picnic sites in the most sensitive area.
Twelve Mile Boat Ramp	Overcrowding and congestion at the Twelve Mile Boat Ramp.	• enlarge parking area. • expand ramp to two lanes. • provide better circulation controls to expedite launching. • consider using a ranger to help direct traffic on peak weekend periods and holidays.

Area/Subject	Problem/Situation	Possible Solutions/Techniques
		• consider establishing a no wake area in the vicinity of the ramp.
		• Figure 1 illustrates a hypothetical launching ramp to demonstrate ways the carrying capacity at a ramp might be increased.
Beaver Trail	Possible underuse of Beaver hiking trail (during the User Survey no hikers were seen on the trail).	• make more people aware that this trail exists--more information, better signs, etc.
Outlet	Need for better and safer shoreline access.	• consider providing additional piers at appropriate locations.
		• improve vehicle and pedestrian access for Outlet fishing.
Campgrounds	Some campsites are overused, and some users want great spacing at Asbury.	• consider using impact type campsites in other appropriate areas (e.g. the sites closest to the lake seem to acquire the most use and wear).
		• place limitations on the number of vehicles per site (and discuss this with campers before establishing a guideline to follow).
		• provide some areas for campers who prefer greater spacing between sites than now exists.
Campgrounds	Group camping on sites as they now exist causes excess wear.	• continue to use and enforce the 8 person/site guideline at the individual campsite.
		• provide for group and multi-family camping situations.
Campgrounds	"Squatter" camping by locals; overzealous gate attendants.	• provide strict and fair enforcements of regulations.
Campgrounds	People visiting campers (and their vehicle) may be increasing the potential for or causing overcrowding and overuse.	• provide separate areas for extra parking.
		• limit the number of visitor passes during any time period; restrictions should be placed on length of stay, time of departure, number of visitors and visiting vehicles.
		• issue a special pass, valid for a specified duration for those persons looking for a site on which to set up camp.

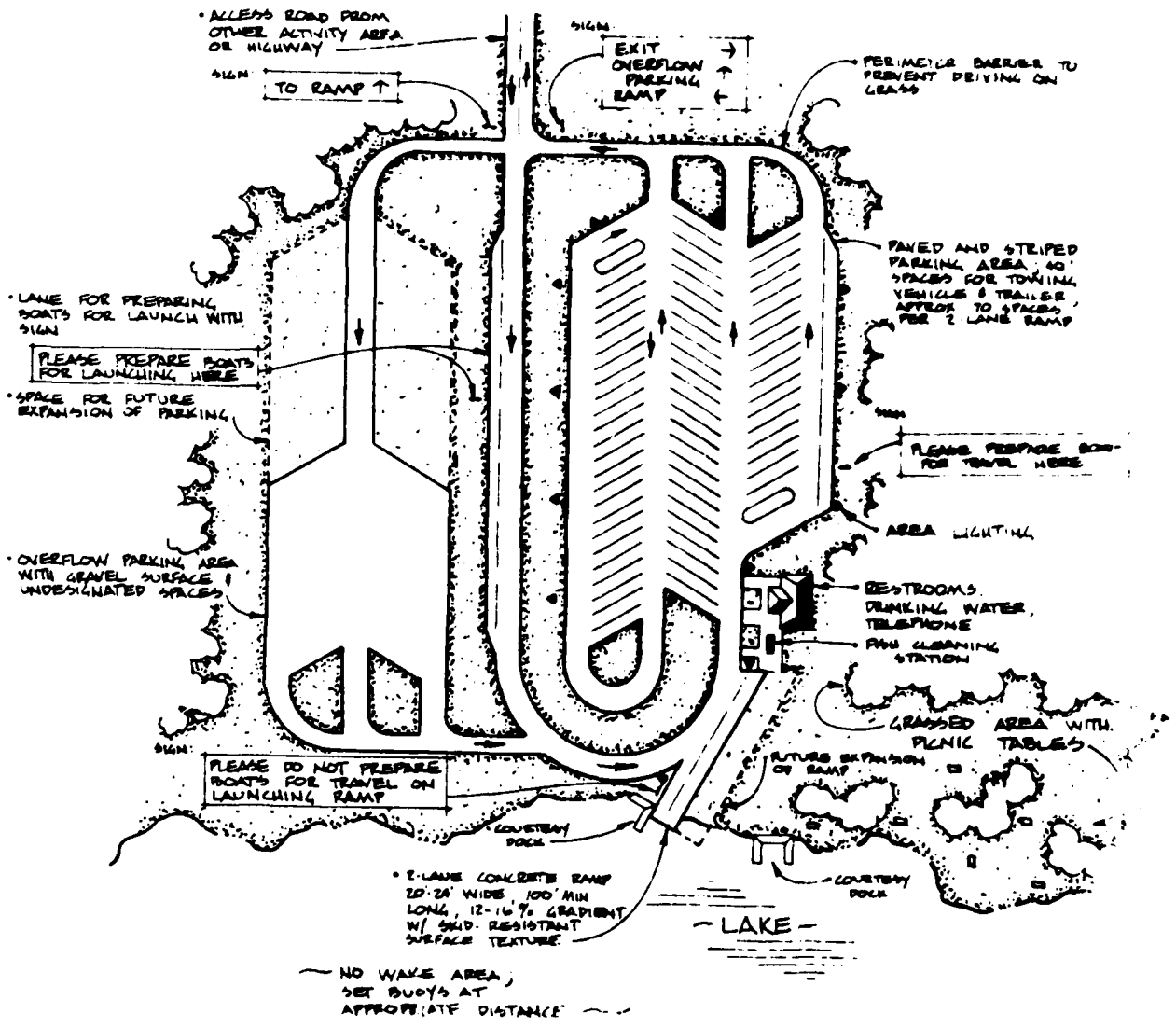

• ACCESS ROAD FROM OTHER ACTIVITY AREA OR HIGHWAY
SIGN
TO RAMP ↑
SIGN
EXIT OVERFLOW PARKING RAMP ↓
PERIMETER BARRIER TO PREVENT DRIVING ON GRASS
PAVED AND STRIPED PARKING AREA 40 SPACES FOR TOWING VEHICLES & TRAILER APPROX 10 SPACES PER 2 LANE RAMP
• LANE FOR PREPARING BOATS FOR LAUNCH WITH SIGN
PLEASE PREPARE BOATS FOR LAUNCHING HERE
• SPACE FOR FUTURE EXPANSION OF PARKING
SIGN
PLEASE PREPARE BOAT FOR TRAVEL HERE
AREA LIGHTING
• OVERFLOW PARKING AREA WITH GRAVEL SURFACE & UNDESIGNATED SPACES
RESTROOMS DRINKING WATER TELEPHONE
PAW CLEANING STATION
GRASSED AREA WITH PICNIC TABLES
SIGN
PLEASE DO NOT PREPARE BOATS FOR TRAVEL ON LAUNCHING RAMP
FUTURE EXPANSION OF RAMP
COURTESY DOCK
COURTESY DOCK
• 2-LANE CONCRETE RAMP 20'-24' WIDE, 100' MIN LONG, 12-16% GRADIENT W/ SKID RESISTANT SURFACE TEXTURE
— LAKE —
— NO WAKE AREA, SET BUOYS AT APPROPRIATE DISTANCE —

Figure 1

Area/Subject	Problem/Situation	Possible Solutions/Techniques
Long Point	Overcrowding and overuse is aggravated because of inadequate parking. Cars park on the grass and beach.	• provide more parking spaces and traffic control devices.
Water surface	Some user conflicts occur on the lake surface between sailboats and power boats, and between boaters and swimmers, and between boaters and boat fishermen.	• consider zoning some cove areas for only nonpower and limited power boats. • make users aware of their role in assuring an enjoyable recreation experience--more education and information. • provide some improved swimming beach areas with float lines, parking and other support facilities. • require boaters to stay a certain distance away from the swimming area.

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]			Approximate # of miles most visitors travel to use area		Average Frequency of visits per year
					% U	% S	% R	High	Average	
OVERCROWDED										
OVERUSED										
UNDERUSED										
WELL-BALANCED										

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

3. CAUSES & EFFECTS OF OVERCROWDING/OVERUSE

Picnicking

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

4. OCCURRENCE OF OVERUSE/DEGRADATION

Use 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

5. 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

Picnicking

7. FACTORS AFFECTING RESOURCE CARRYING CAPACITY

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

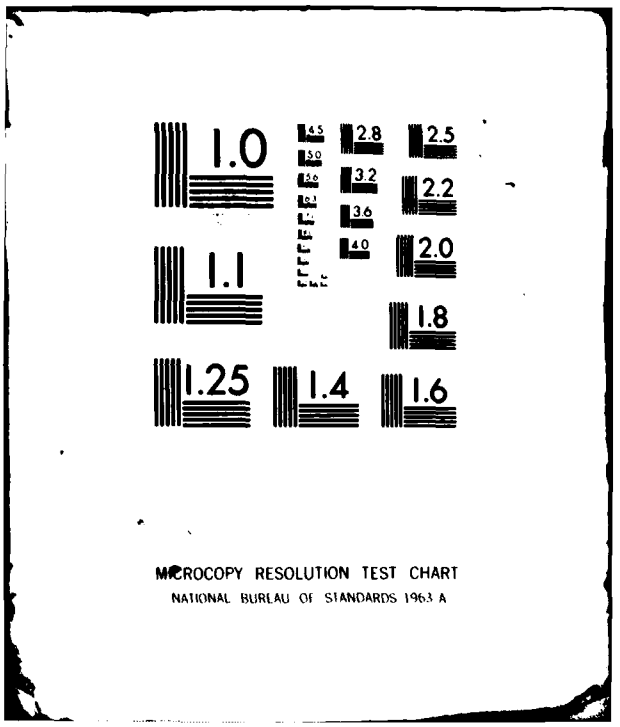
o

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 managemen feasibility (pros/cons why the technique could or could not be implemented)

AD-A089 630 URBAN RESEARCH AND DEVELOPMENT CORP BETHLEHEM PA F/G 13/2
RECREATION CARRYING CAPACITY FACTS AND CONSIDERATIONS. REPORT 3--ETC(U)
JUL 80 DACW39-78-C-0096
UNCLASSIFIED WES-MP-R-80-1-3 NL


1.0
1.1
1.25
1.4
1.6
1.8
2.0
2.2
2.5
2.8
3.2
3.6
4.0
4.5
5.0
5.6
6.3
MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS 1963 A

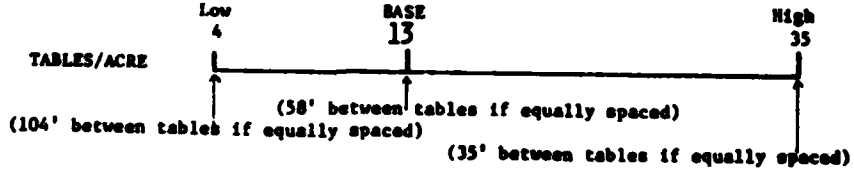
Picnicking

10. POSSIBLE CARRYING CAPACITIES

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:			

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 AWARENESS	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				
SITE ACCESS	Relationship to Main Highway	Distance to area from main highway				
	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, archeologic features				
		Abundance of wildlife				
		Water feature				

NATURAL AMENITIES	From the Use Area	Visibility to water features			
		(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			
FACILITIES & SERVICES	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			
PLANNING DESIGN ASPECTS	Distance between campsites	Minimum			
		Maximum			
		Average			
	Distance between campsites and the facilities	Minimum			
		Maximum			
		Average			
	Space for camper unit maneuverability	Ample			
		Acceptable			
		Restrictive			
	Access Control	Controlled (gate, attendant)			
		Uncontrolled			

Car Parking	Parking space on each camp-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 <u>increase</u> and/or to <u>limit</u> 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 ☐

ENG Form 4159
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:

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

Hartwell

Location

Hartwell Lake (Savannah District) is located on the upper reaches of the Savannah River in Georgia and South Carolina. It extends in two main branches up the Tugaloo and Seneca Rivers. The damsite is located approximately 15 miles southwest of Anderson, South Carolina.

Authorization and purpose

The Hartwell Lake Project was authorized by the Flood Control Act of 1950 for the purposes of flood control and hydroelectric power generation.

Project area size and features

The Tugaloo arm of the lake is 49 miles long, while the Seneca arm of the lake is 45 miles long. Total land and water area at the project is over 80,000 acres. At the normal recreational pool elevation of 660 feet msl from May through August, the lake has a surface area of approximately 56,000 acres and a ruggedly indented shoreline of 962 miles. The Corps administers a narrow strip of land (averaging 200 feet in width) around the shoreline.

In addition to the recreational opportunities provided by the lake, Hartwell also provides valuable hydroelectric power. Flood control is another important function of the lake: 293,000 acre-feet of floodwaters can be stored above normal pool capacity.

Corps personnel at the project area include two resource managers, a Chief Ranger, patrolling rangers, park technicians, and office and maintenance personnel.

Topography

The reservoir is situated in the rolling hills of the upper Piedmont Plateau and the lower foothills of the Blue Ridge Mountains. Around the reservoir, the topography is rugged with slopes varying from five percent to over 25 percent. Peninsulas with irregular shorelines form numerous bays, and a number of islands are located in the reservoir.

Climate

Normal temperatures range from the middle 80 degrees F. (with extremes to 100 degrees F.) in summer, to the low 30 degrees F. (with extremes to -10 degrees F.) in the winter. The average annual temperature is 57 degrees F. The average annual precipitation consists of 48 inches of rain and two inches of snow. Prevailing winds are from the south at about seven mph in the summer, and from the west at about eight mph in the winter. Throughout the year, 62 percent of the days are sunny.

Soils and vegetation

Soils in the upper reaches of the project area are moderately deep, loamy and clayey. Runoff is rapid and soil erosion is a problem when areas are cleared. In the lower reaches, soils are deep and well-drained. On moderately steep slopes, the surface layers are severely eroded.

Vegetation consists of cut-over mixed pine and upland hardwood forests; bottomland hardwoods occur along the tributaries leading to the lake.

Fish and wildlife

Sport fishing is a major attraction at the lake, with white and black crappie, bluegill, and largemouth bass the most common sport fish taken. Other species of fish include rainbow and brown trout; channel, white, and flathead catfish; hybrid, striped, white, and redeye bass; redbreasted sunfish; sauger; and walleye.

During migratory periods only small numbers of water fowl utilize the lake. Wildlife management programs for big game species are not practical, because the Corps administers only a narrow land area. However, many wildlife species presently exist at the project. They include: mourning dove, bobwhite quail, swamp and cottontail rabbit, and gray and fox squirrels. Deer, wild turkey, and beavers are increasing in number throughout the Savannah River Basin.

Population areas
served and accessibility

The 1970 population of the area within a 100-mile radius of Hartwell Lake was approximately four million persons, including the metropolitan areas of Asheville, North Carolina, Greenville, Spartanburg, and Columbia, South Carolina, and Athens, Atlanta, and Augusta, Georgia.

Primary access to the project area from the major metropolitan areas in Georgia and South Carolina is provided by I-85, which spans the reservoir approximately 15 miles north of the dam. Encircling the reservoir and connecting with I-85 are numerous primary and secondary roads.

Recreation areas

The project area offers many recreational opportunities: camping, picnicking, fishing, boating, hiking, sightseeing, and interpretive programs. Within the project area, the Corps operates 70 recreational areas which occupy over 3000 acres. These recreation areas range in size from one acre to 369 acres. Twenty of the areas provide for tent and trailer camping. All other recreation areas are designated for day use only. Facilities offered at the Corps recreation areas include camping sites for tents and trailers, running water, picnic tables, stoves, boat launching ramps, comfort stations, swimming areas, and parking lots. In addition to the areas operated by the Corps, four concessions and 16 recreation areas are leased from the Corps.

Visitation

The visitation at Hartwell Lake is one of the highest among all Corps lakes in the nation. Visitor attendance in 1978 reached 11,420,500. Although the recreation season is year round, June was the month of highest visitation in 1978, with 1,911,900 recreation days.

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 3: Hartwell Lake 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, 87, [25] p. : ill. ; 27 cm. (Miscellaneous paper - U. S. Army Engineer Waterways Experiment Station ; R-80-1, Report 3)
Prepared for Office, Chief of Engineers, U. S. Army, Washington, D. C., under Contract No. DACW39-78-C-0096.
Project map of Hartwell Lake in pocket at end of report.

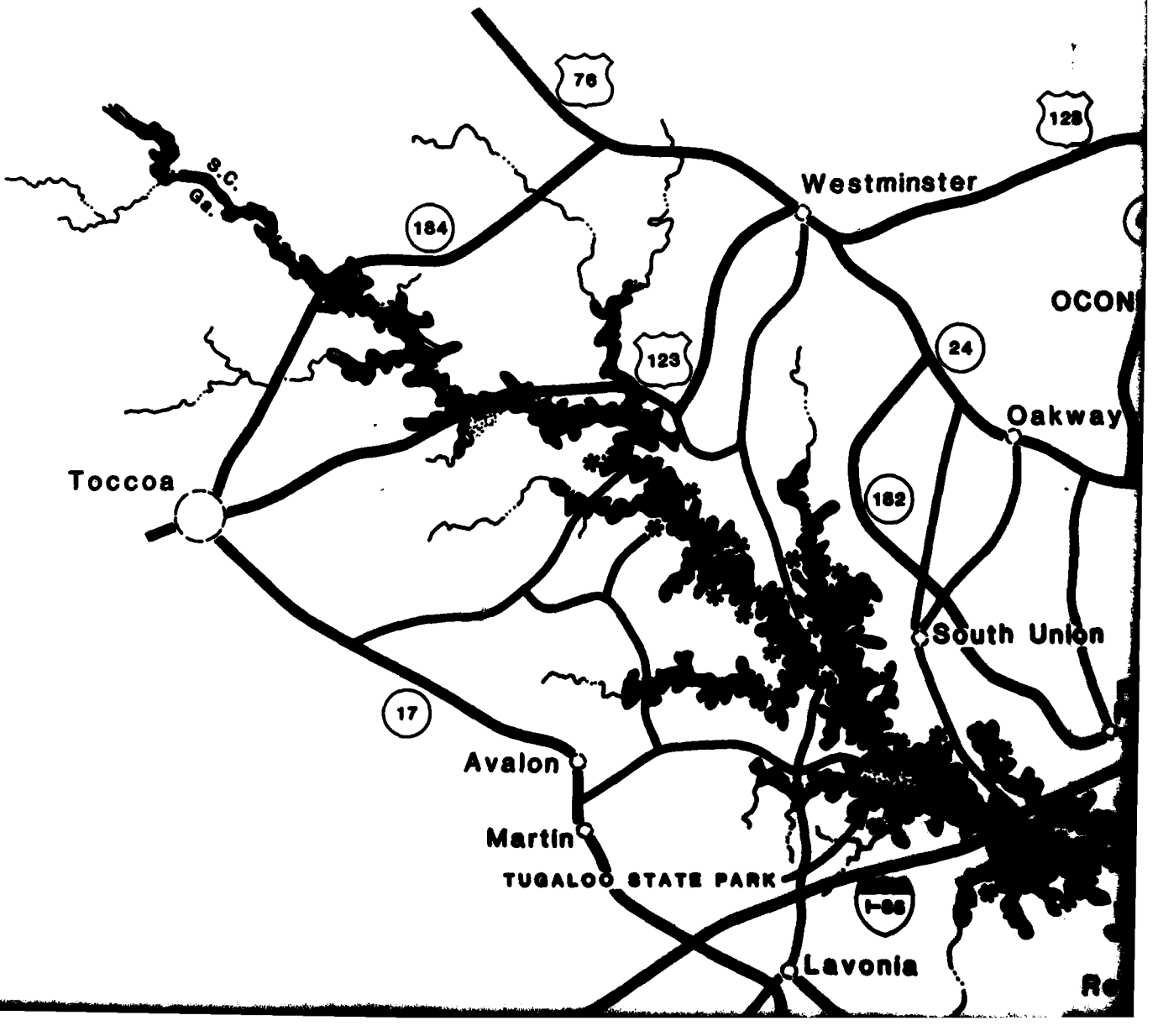
1. Hartwell Lake Project. 2. Carrying capacity. 3. Monitoring. 4. Overcrowding. 5. Recreation. 6. Recreation resource planning. 7. Recreational areas. 8. Recreational facilities. 9. Utilization. I. United States. Army. Corps of Engineers. II. Series: United States. Waterways Experiment Station, Vicksburg,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

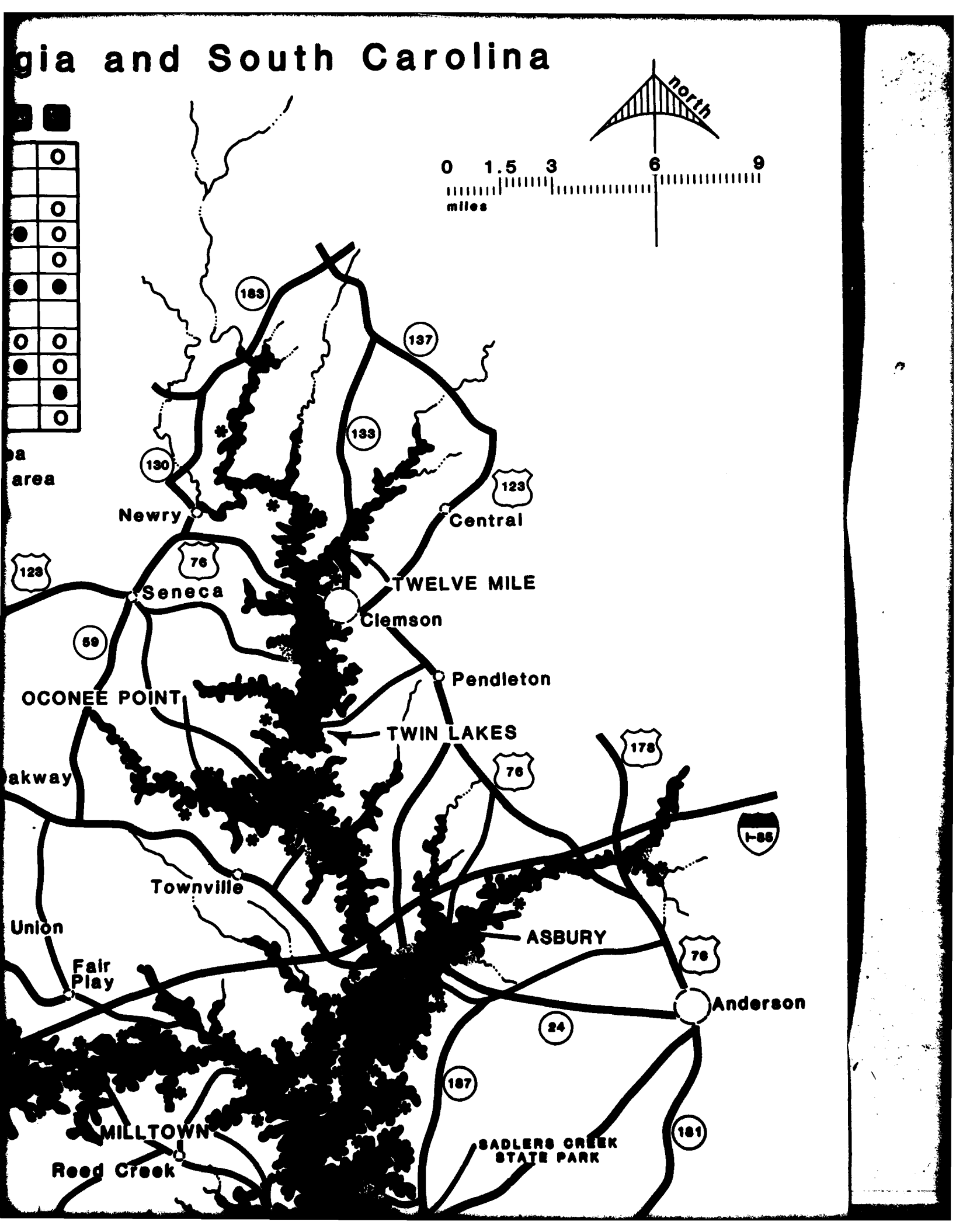
Hartwell Lake, Georgia

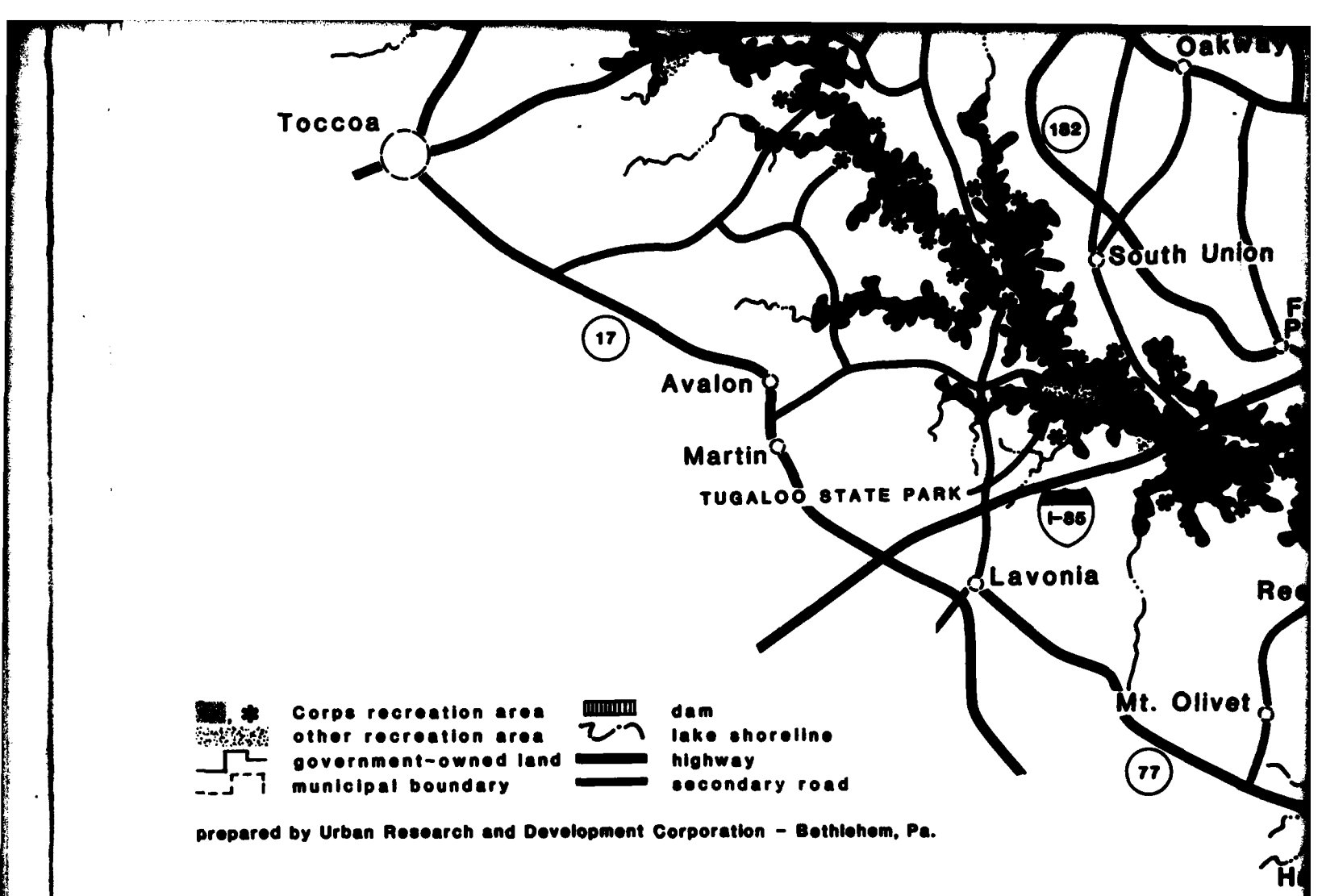
CORPS OF ENGINEERS RECREATION AREAS										
ASBURY	O	O	●		O			O		O
CRESCENT			●							
HARTWELL LAKE	O				●					O
LONG POINT	●	O			O			●	●	O
MILLTOWN	O	O	●		●					O
OCONEE POINT	●	O	●		●				●	●
OUTLET					●					
SINGING PINES	O	O			●			●	O	O
TWELVE MILE	●	●			●			●	●	O
TWIN LAKES	O	O	O		●			O		●
WATSADLERS	O	O	●		O					O

O denotes activity offered in recreation area

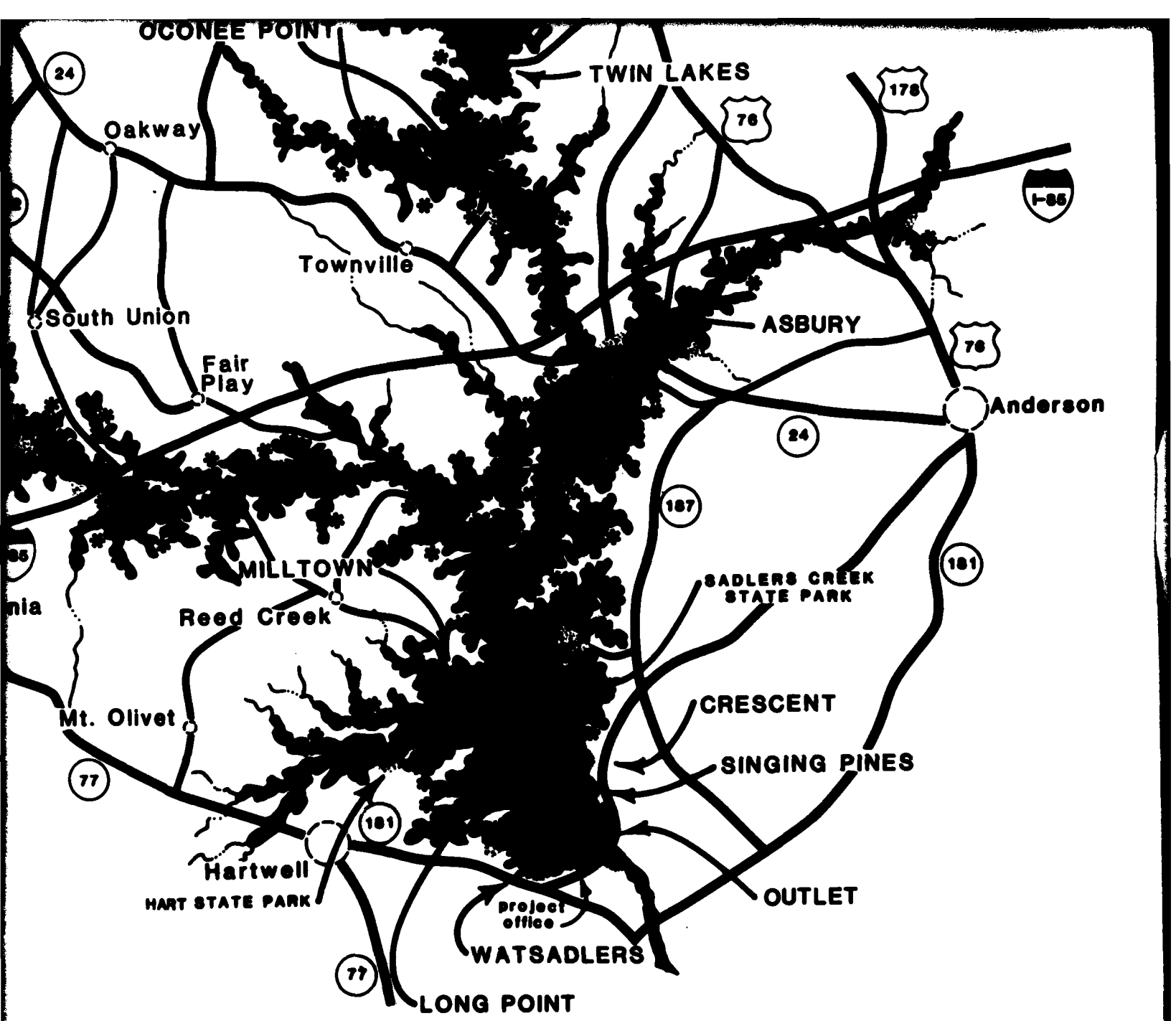
● denotes interviews conducted in activity area




gia and South Carolina
north
0 1.5 3 6 9
miles
183
137
133
130
123
Newry
Central
123
76
Seneca
TWELVE MILE
Clemson
59
Pendleton
OCONEE POINT
TWIN LAKES
178
76
I-85
Townville
Union
ASBURY
Fair Play
76
Anderson
24
187
MILLTOWN
Reed Creek
SADLERS CREEK STATE PARK
181



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


OCONEE POINT
TWIN LAKES
24
Oakway
76
178
I-85
Townville
South Union
ASBURY
Fair Play
76
Anderson
24
187
MILLTOWN
181
SADLERS CREEK STATE PARK
Reed Creek
CRESCENT
Mt. Olivet
SINGING PINES
77
181
Hartwell
HART STATE PARK
OUTLET
project office
WATSADLERS
77
LONG POINT