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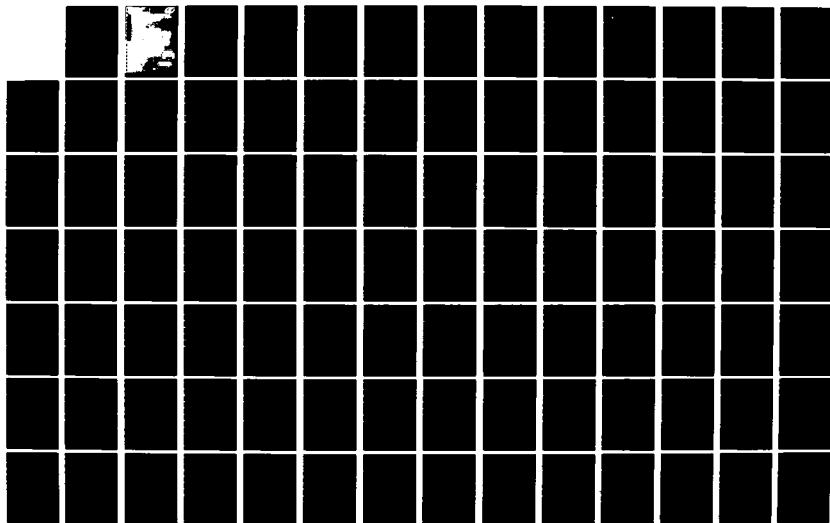
METHODOLOGY AND FORECASTS OF RECREATION USE AND SMALL
CRAFT LOCKAGES ON T. (U) MIDWEST RESEARCH INST KANSAS
CITY MO R M MISCHON 26 JUL 78 DACW37-77-C-0075

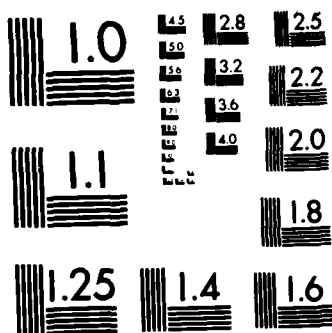
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20. ABSTRACT (Continue on reverse side if necessary and identify by block number) This report contains the findings, conclusions and recommendations for the Upper Mississippi Recreation Use and Small Craft Lockage Study. The study area extended from Minneapolis/St. Paul, Minnesota to just north of the confluence of the Missouri River with the Mississippi, north of St. Louis, Mo. The overall objective of the recreation lockage study was to document present usage and develop a model for recreational use forecasting.			

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METHODOLOGY AND FORECASTS OF RECREATION USE AND SMALL CRAFT
LOCKAGES ON THE UPPER MISSISSIPPI RIVER

VOLUME II

FINAL REPORT
July 26, 1978

Contract No. DACW 37-77-C-0075
MRI Project No. 4387-D

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PREFACE

This report contains the findings, conclusions and recommendations for the Upper Mississippi Recreation Use and Small Craft Lockage study. Throughout the study, MRI worked closely with the St. Paul District. Some of the important study benchmarks included: the initial presentation in St. Paul recommending the recreation lockage survey, the subsequent survey which was conducted during the months of July and August, the public participation workshops held at three key cities along the Mississippi River, and finally a presentation of MRI's findings, conclusions and recommendations.

Volume II of this report contains the appendices which document the multiple regression analysis and gravity model utilized to forecast potential marina markets for the Mississippi River. Appendix E contains the documentation for the forecasting model itself. It is anticipated this model will continue to undergo revision as data coefficients and other important variables affecting lockage are studied.

The project director for this study was Mr. Raymond M. Mischon. The survey instrument was designed and supervised by Mrs. Greta O'Keefe and Ms. Cheryl Fellhauer. Because of the statistical techniques and computer analyses utilized in this study, several individuals were involved at various stages. Mr. Leroy Adams, Senior Computer Specialist, and Mr. Mike Sharp, Senior Statistician, performed the regression analysis and assisted in developing the forecasting model. Mr. Jim Miller, Consultant in Computer Science, supervised preparation of the survey data and provided all analyses of the data. Mr. Barry Sanders, also Consultant in Computer Science, provided assistance in the gravity analysis. The on-site recreation lockage survey was accomplished by four college students from the Kansas City area. These were Messrs. John Bingham, Paul James, Ray Mischon, Jr., and Graham Wheeler.

Special thanks go to Mr. Jim Holleran, Outdoor Recreation Planner, and Mr. Don Wadleigh, Water Resources Planner, both with the St. Paul District; also to Mr. Dave Arndorfer of Roy F. Weston, Inc., who supplied data from the Lake Superior Boating Survey.

Many other Corps staff from the St. Louis, Rock Island, and St. Paul districts assisted in collecting and providing interpretation of data. It has been a pleasure being a part of this benchmark study, and we are certain that the results will have long-lasting benefits in planning facilities and services for recreation craft on the Mississippi River.

MIDWEST RESEARCH INSTITUTE

Raymond M. Mischon

Raymond M. Mischon, Manager
Leisure/Recreation Programs

Approved:

A. E. Vandegrift

A. E. Vandegrift, Director
Economics and Management
Science Division

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APPENDIX A

SURVEY INSTRUMENT



MIDWEST RESEARCH INSTITUTE

425 Volker Boulevard
Kansas City, Missouri 64110

Interviewer: _____ Date: _____ Time: _____

Day of Week: (1) Monday
(2) Tuesday
(3) Wednesday
(4) Thursday
(5) Friday
(6) Saturday
(7) Sunday

Lock No: _____ Direction: (1) Up _____ (2) Down _____

Type of Craft:

(01) Runabout _____ (05) House/Pontoon boat _____
(02) Cruiser, motorized _____ (06) Fishing boat _____
(03) Cruiser, large _____ (07) Other (please specify) _____
(40 ft or over) _____
(04) Cruiser, sailing _____

Number of persons: _____

What is your place of residence? _____

(City, State, Zipcode)

Where did you put your boat in the river? _____

Is your boat moored there? (1) Yes _____ (2) No _____

If not, did you transport your boat
by trailer to the launch ramp? (1) Yes _____ (2) No _____

What is the destination of this boat trip? _____

On this entire trip how many locks will you lock
through? _____

Questionnaire No. _____
1 4

5 7 9

13

14 16

17

19

21

River Mile: _____
24

Road Miles: _____
27

30

31

River Mile: _____
22

35

Is this a (1) one-way trip?____(2) round trip?____

37

Is this a (1) one-day trip?____(2) two-day trip?____
(3) three days or more?____

38

Are you traveling in a group of boats? (1) Yes____ (2) No____

39

If yes, how many boats are in your group?____

40

Other than boating, which of the following recreational
activities will you participate in on this trip:

Fishing _____

42

Swimming _____

43

Waterskiing _____

44

Picnicking _____

45

Camping:

On the dredge spoil islands _____

46

Other areas _____

47

Other (Please specify):

48

49

50

51

From May 1 through Labor Day, how many trips of this
type will you take?

(1) 1-5____(2) 6-20____ (3) 21 and over____

52

Do you have any comments concerning locks or lock
usage? _____

53

55

57

59

61

APPENDIX B

SIGNIFICANT CHI-SQUARE RELATIONSHIPS
(Recreation Lockage Survey)

CROSS TABULATIONS

08/28/77. PAGE 8

FILE DATA (CREATION DATE = 08/28/77.)

***** C P O S T A R U L A T I O N O *****
 VAR043 TIME PERIOD OF DAY BY VAR044 TOTAL PIVER MILFS
 ***** PAGE 1 OF 1

VAR044													
COUNT													
ROW PCT	10	TO	50	51	TO	100	TO	151	TO	201	OR	4	ROW
COL PCT	1	1	1	2	1	50	00	00	00F	5			TOTAL
TOT PCT	1	1	1	2	1	1	3	4	1	5	1		
VAR043													
0600 TO 1200	1	1	71	1	48	1	22	1	6	1	45	1	192
	1	1	37.0	1	25.0	1	11.5	1	3.1	1	23.4	1	13.1
	1	1	10.8	1	16.1	1	17.7	1	7.7	1	14.7	1	
	1	1	4.4	1	3.3	1	1.5	1	.4	1	3.1	1	
1201 TO 1400	2	1	518	1	240	1	93	1	54	1	222	1	1127
	1	1	46.0	1	21.3	1	8.3	1	4.8	1	19.7	1	77.0
	1	1	78.8	1	80.3	1	75.0	1	69.2	1	72.5	1	
	1	1	35.4	1	16.4	1	6.4	1	7.7	1	15.2	1	
1401 TO 2400	3	1	68	1	11	1	9	1	18	1	39	1	145
	1	1	45.9	1	7.6	1	6.2	1	12.4	1	26.9	1	9.9
	1	1	10.4	1	3.7	1	7.3	1	23.1	1	12.7	1	
	1	1	4.6	1	.8	1	.6	1	1.2	1	2.7	1	
COLUMN	657	299	124	78	306	1464							1464
TOTAL	44.9	20.4	8.5	5.3	20.9	100.0							100.0

RAW CHI SQUARE = 40.03622 WITH 8 DEGREES OF FREEDOM. SIGNIFICANCE = .0000

CHAMBERS V = .11693

CONTINGENCY COEFFICIENT = .16315

LAMHDA (ASYMMETRIC) = 0 WITH VAR043 DEPENDENT.

LAMHDA (SYMMETRIC) = 0 WITH VAR043 DEPENDENT.

UNCERTAINTY COEFFICIENT (ASYMMETRIC) = .01943 WITH VAR043 DEPENDENT. = .00994 WITH VAR044 DEPENDENT.

UNCERTAINTY COEFFICIENT (SYMMETRIC) = .01319

KENDALL'S TAU B = -.01445. SIGNIFICANCE = .2643

KENDALL'S TAU C = -.01121. SIGNIFICANCE = .2683

GAMMA = -.02751

SOMERS'S D (ASYMMETRIC) = -.01063 WITH VAR043 DEPENDENT.

SOMERS'S D (SYMMETRIC) = -.01340

FTA SUPD = .13823 WITH VAR043 DEPENDENT.

FTA SUPD = .07240 WITH VAR044 DEPENDENT.

CROSS TABULATIONS

08/28/77. PAGE 17

FILE DATA1 (CREATION DATE = 08/28/77.)

***** C P O S T A R U L A T I O N O F *****
 VAR042 WEEKEND-WEEKDAY BY VAR019 DAYS IN TRANSIT
 ***** PAGE 1 OF 1

VAR019					
COUNT					
ROW	PCT	ONE DAY	TWO DAYS	THREE OR MORE	ROW TOTAL
COL	PCT	1	2	3	
TOT	PCT	1	2	3	

VAR042					
1		98	45	373	506
WEEKDAY		17.4	8.9	73.7	34.6
2		20.6	16.9	48.6	
WEEKEND		6.0	3.1	25.5	
3		339	222	394	955
WEEKEND		35.5	23.2	41.3	65.4
4		19.4	13.1	51.4	
5		23.2	15.2	27.0	
COLUMN TOTAL		427	267	767	1461
TOTAL		29.2	18.3	52.5	100.0

RAW CHI SQUARE = 140.76165 WITH 2 DEGREES OF FREEDOM. SIGNIFICANCE = 0
 CRAMER'S V = .31040
 CONTINGENCY COEFFICIENT = .29644
 LAMHDA (ASYMMETRIC) = 0 WITH VAR042 DEPENDENT.
 LAMHDA (SYMMETRIC) = 0
 UNCERTAINTY COEFFICIENT (ASYMMETRIC) = .07732 WITH VAR042 DEPENDENT.
 UNCERTAINTY COEFFICIENT (SYMMETRIC) = .06033
 KENDALL'S TAU B = -.27301. SIGNIFICANCE = .0000
 KENDALL'S TAU C = -.24501. SIGNIFICANCE = .0000
 GAMMA = -.51466
 SOMER'S D (ASYMMETRIC) = -.23606 WITH VAR042 DEPENDENT.
 SOMER'S D (SYMMETRIC) = -.27015
 ETA SQRD = .31040 WITH VAR042 DEPENDENT.
 = .27542 WITH VAR019 DEPENDENT.

NUMBER OF MISSING OBSERVATIONS = 3

CROSS TABULATIONS

08/28/77. PAGE 15

FILE DATA (CREATION DATE = 08/28/77.)

***** C R O S S T A B U L A T I O N O F *****
 VAR042 WEEKEND-WEEKDAY ***** TOTAL LOCKS PASSED *****
 ***** PAGE 1 OF 1

VAR045												
COUNT	1	2	3	4	5	6	7	8	9	10	11	12
ROW PCT	10	10	10	10	10	10	10	10	10	10	10	10
COL PCT	1	1	1	1	1	1	1	1	1	1	1	1
TOT PCT	1	1	1	1	1	1	1	1	1	1	1	1
VAR042	1	1	1	1	1	1	1	1	1	1	1	1
WEEKDAY	1	1	1	1	1	1	1	1	1	1	1	1
WEEKEND	2	2	2	2	2	2	2	2	2	2	2	2
COLUMN	782	265	121	296	1464							
TOTAL	53.4	18.1	8.3	20.2	100.0							

RAW CHI SQUARE = 106.90439 WITH 3 DEGREES OF FREEDOM. SIGNIFICANCE = .0000
 CRAMER'S V = .27023
 CONTINGENCY COEFFICIENT = .26087
 LAMHDA (ASYMMETRIC) = .07298 WITH VAR042 DEPENDENT.
 LAMHDA (SYMMETRIC) = .03112
 UNCERTAINTY COEFFICIENT (ASYMMETRIC) = .05547 WITH VAR042 DEPENDENT.
 UNCERTAINTY COEFFICIENT (SYMMETRIC) = .03035
 KENDALL'S TAU A = -.23914. SIGNIFICANCE = .0000
 KENDALL'S TAU C = -.24629. SIGNIFICANCE = .0000
 GAMMA = -.41531
 SOMER'S D (ASYMMETRIC) = -.20206 WITH VAR042 DEPENDENT.
 SOMER'S D (SYMMETRIC) = -.23578
 ETA SQRD = .27023 WITH VAR042 DEPENDENT.
 = .26220 WITH VAR045 DEPENDENT.

CROSS TABULATIONS

08/28/77.

PAGE 49

FILE DATA1 (CREATION DATE = 08/28/77.)

***** C R O S S T A B U L A T I O N O F *****
 VAR014 ROAD MOVED AT ENTRY ***** ROAD MILES TRAVELED *****
 ***** PAGE 1 OF 1 *****

		VAR048										ROW TOTAL	
COUNT		1 1 1 2 1 3 1 4 1											
VAR014	YES	1	480	1	78	1	55	1	137	1	750		
		1	64.0	1	10.4	1	7.3	1	18.3	1	51.4		
		1	68.4	1	54.9	1	41.4	1	32.0	1			
		1	34.2	1	5.6	1	3.9	1	9.8	1			
		-	-	-	-	-	-	-	-	-			
		2	222	1	64	1	78	1	291	1	655		
		1	33.9	1	9.8	1	11.9	1	44.4	1	46.6		
		1	31.6	1	45.1	1	58.6	1	68.0	1			
		1	15.8	1	4.6	1	5.6	1	20.7	1			
		-	-	-	-	-	-	-	-	-			
	NO	COLUMN	702	142	133	428					1405		
		TOTAL	50.0	10.1	9.5	30.5					100.0		

RAW CHI SQUARE = 149.85107 WITH 3 DEGREES OF FREEDOM. SIGNIFICANCE = 0

GRAMER'S V = .32654

CONTINGENCY COEFFICIENT = .31045

LAMHDA (ASYMMETRIC) = .27023 WITH VAR014 DEPENDENT.

LAMHDA (SYMMETRIC) = .18115

UNCERTAINTY COEFFICIENT (ASYMMETRIC) = .07866 WITH VAR014 DEPENDENT. = .04670 WITH VAR048 DEPENDENT.

UNCERTAINTY COEFFICIENT (SYMMETRIC) = .05861

KENDALL'S TAU B = .30504. SIGNIFICANCE = .0000

KENDALL'S TAU C = .34389. SIGNIFICANCE = .0000

GAMMA = .50579

SOMERS'S D (ASYMMETRIC) = .26935 WITH VAR014 DEPENDENT.

SOMERS'S D (SYMMETRIC) = .30270

FTA SORD = .32654 WITH VAR014 DEPENDENT.

FTA SORD = .32613 WITH VAR048 DEPENDENT.

NUMBER OF MISSING OBSERVATIONS = 50

CROSS TABULATIONS

08/28/77.

PAGE 50

FILE DATA CREATION DATE = 08/28/77.)

***** CROSS TABULATION OF *****
 VAR014 ROAT MOORED AT ENTRY BY VAR044 TOTAL RIVER MILES *****
 ***** PAGE 1 OF 1

VAR044

COUNT	51 TO 100 TO 1 151 TO 2 201 OR 4										ROW TOTAL
	10 TO 50	0	50	1	2	3	4	5	6	7	
VAR014											
YES	1	322	134	53	43	198	750				
		42.9	17.9	7.1	5.7	26.4	53.4				
		51.3	47.3	44.9	56.6	66.0					
		22.9	9.5	3.9	3.1	14.1					
NO	2	306	149	65	33	102	655				
		46.7	22.7	9.9	5.0	15.6	46.6				
		48.7	52.7	55.1	43.4	34.0					
		21.8	10.6	4.6	2.3	7.3					
TOTAL	424	283	118	74	300	1405					
	44.7	20.1	8.4	5.4	21.4	100.0					

RAW CHI SQUARE = 28.16410 WITH 4 DEGREES OF FREEDOM. SIGNIFICANCE = .0000

CRAMER'S V = .14158

CONTINGENCY COEFFICIENT = .14014

LAMHDA (ASYMMETRIC) = .04122 WITH VAR014 DEPENDENT.

LAMHDA (SYMMETRIC) = .01885

UNCERTAINTY COEFFICIENT (ASYMMETRIC) = .01472 WITH VAR014 DEPENDENT.

UNCERTAINTY COEFFICIENT (SYMMETRIC) = .00943

KENDALL'S TAU B = -.07916. SIGNIFICANCE = .0006

KENDALL'S TAU C = -.09373. SIGNIFICANCE = .0006

GAMMA = -.13303

SOMER'S D (ASYMMETRIC) = -.06656 WITH VAR014 DEPENDENT.

SOMER'S D (SYMMETRIC) = -.07799

ETA SQRO = .14158 WITH VAR014 DEPENDENT.

ETA SQRO = .10935 WITH VAR044 DEPENDENT.

NUMBER OF MISSING OBSERVATIONS = 50

CROSS TABULATIONS

08/28/77.

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FILE DATA (CREATION DATE = 08/28/77.)

***** C R O S S T A B U L A T I O N O F *****
 VAR014 ROAT MOVED AT ENTRY ***** BY VAR019 DAYS IN TRANSIT *****
 ***** PAGE 1 OF 1

		COUNT			ROW		
		ROW	PCT	ONE	DAY	TWO	DAYS
		COL	PCT	ONE	DAY	THREE	OR
		TOT	PCT	ONE	DAY	THREE	TOTAL
				1	2	3	
VAR014							
YES		1	14.8	123	1	476	747
				19.8	1	63.7	53.3
				36.7	1	63.4	
				10.6	1	34.0	
NO		2	255	125	1	275	655
				38.9	1	42.0	46.7
				63.3	1	36.6	
				18.2	1	19.6	
TOTAL		403	24.7	248	751	1402	100.0

RAW CHI SQUARE = 76.51421 WITH 2 DEGREES OF FREEDOM. SIGNIFICANCE = .0000

CRAMER'S V = .23361

CONTINGENCY COEFFICIENT = .22749

LAMBDA (ASYMMETRIC) = .16641 WITH VAR014 DEPENDENT.

LAMBDA (SYMMETRIC) = .08346

UNCERTAINTY COEFFICIENT (ASYMMETRIC) = .03984 WITH VAR014 DEPENDENT.

UNCERTAINTY COEFFICIENT (SYMMETRIC) = .03257

KENDALL'S TAU A = -.22211. SIGNIFICANCE = .0000

KENDALL'S TAU C = -.24261. SIGNIFICANCE = .0000

GAMMA = -.30054

SOMERS'S D (ASYMMETRIC) = -.20246 WITH VAR014 DEPENDENT.

SOMERS'S D (SYMMETRIC) = -.22116

ETA SQRD = .23361 WITH VAR014 DEPENDENT.

ETA SQRD = .23359 WITH VAR019 DEPENDENT.

NUMBER OF MISSING OBSERVATIONS = 62

FILE DATA (CREATION DATE = 09/28/77.)

```

***** C R O S S T A B U L A T I O N   O F *****
***** R O A T   M O U N T E D   A T   E N T R Y *****
***** V A R 0 1 4 ***** R Y   V A R 0 4 5 ***** T O T A L   L O C K S   P A S S E D *****
***** P A G E   1   O F   1 *****

```

PAGE 1 OF 1

VANDAS																									
COUNT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
ROW PCT	10	10	5																						
COL PCT	1																								
TOT PCT	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	

1	395	1	10A	1	50	1	197	1	750																
	52.7	1	14.4	1	6.7	1	26.3	1	53.4																
	53.2	1	42.4	1	43.5	1	67.5	1																	
	28.1	1	7.7	1	3.6	1	14.0	1																	

2	34A	1	147	1	65	1	95	1	655																
	53.1	1	22.4	1	9.9	1	14.5	1	46.6																
	46.8	1	57.6	1	56.5	1	32.5	1																	
	24.8	1	10.5	1	4.6	1	6.8	1																	

COLUMN	743	255	115	292	1405																				
TOTAL	52.9	1A.1	A.2	20.8	100.0																				

RAW CHI SQUARE = 40.28514 WITH 3 DEGREES OF FREEDOM. SIGNIFICANCE = .0000

CHAMBERS V = .16933

$$\text{CONTINGENCY COEFFICIENT} = .16695$$

CONTINGENCY COEFFICIENT = .16695
LAMRDA (ASYMMETRIC) = .09244 WITH VAR014 DEPENDENT.

LAMBDA (ASYMMETRIC) = .09244 WITH VAR014 DEPENDENT.
= 0 WITH VAR045 DEPENDENT.

$$\text{LAMBDA (SYMFTRIC)} = .04100$$

UNCERTAINTY COEFFICIENT (ASYMMFTRIC) = .02106 WITH VAP014 DEPENDENT.

UNCERTAINTY COEFFICIENT (ASYMMETRIC) = .02106 WITH VAP014 DEPENDENT.
= .01235 WITH VAP045 DEPENDENT.

UNCERTAINTY COEFFICIENT (SYMMETRIC) = .01557

KENDALL'S TAU B = -.04281. SIGNIFICANCE = .0172

RENDALL "S" TAU C = -.05949.
SIGNIFICANCE = .0172

REYNOLDS' SIAU C = -.03224.
 GAMMA = -.09292
 SIGNIFICANCE = .0177

5 AMMA = -.09392

SOMERS'S D (ASYMMETRIC) = -.04666 WITH VAR014 DEPENDENT.

SOMERS'S D (SYMMETRIC) = -.05240

ETA SORD = .16933 WITH VAR014 DEPENDENT.

= .09615 WITH VAR045
DEPENDENT.

- - - - - DEPENDENT.

NUMBER OF MISSING OBSERVATIONS = 59

VAR014	BOAT MOOPED AT ENTRY	C R O S S T A B U L A T I O N O F	NUMRFR OF TRIPS	PAGE 1 OF 1
		RY VAR032		

COUNT		ROW	COL	11-5	TRIP	6-20	TRI	21	OR	40	ROW
PT	CT	PT	CT	PT	CT	PT	CT	PT	CT	PT	CT
VAR014	1	1	1	28.0	1	37.7	1	8.7	1	74.4	74.4
YES	1	1	1	37.6	1	50.7	1	11.7	1	53.3	53.3
	1	1	1	41.9	1	61.7	1	74.4	1		
	1	1	1	20.1	1	27.0	1	6.2	1		
	2	1	1	38.8	1	23.4	1	30.1	1	65.2	65.2
NO	1	1	1	59.5	1	35.9	1	4.6	1	46.7	46.7
	1	1	1	58.1	1	38.3	1	25.6	1		
	1	1	1	27.8	1	16.8	1	2.1	1		
COLUMN	668	668	611	117	117						1398
TOTAL	47.9	47.9	43.8	8.4	8.4						100.0

RAW CHI SQUARE = 72.95220 WITH 2 DEGREES OF FREEDOM. SIGNIFICANCE = .0000

CRAMER'S V = .22860

CONTINGENCY COEFFICIENT = .22285

CONTINUITY COEFFICIENT = 0.27284
LAMBDA (ASYMMETRIC) = 16564 WITH VARIOUS
DEPENDENT

LAMHDA (ASYMMETRIC) = .16304 WITH VARIATION 14 DEPENDENT.
LAMHDA (SYMMETRIC) = -.14855

$\text{LAMBDA (SIMPLE)} = .1455$
 $\text{UNCERTAINTY COEFFICIENT (ASYMPTOTIC)} = .07048$

COEFFICIENT OF VARIATION = 0.3968 WITH VARIATION (ASYMMETRIC) = 0.2301

UNCERTAINTY COEFFICIENT (SYMMETRIC) = .03297

KENDALL'S TAU B = -.22139.
SIGNIFICANCE = .0000

KENDALL'S TAU C = -.23637. SIGNIFICANCE = .0000

GAMMA = -.40312

SOMERS'S D (ASYMMETRIC) = -.20646 WITH VAR014 DEPENDENT

$$\text{SOMFPS}'S \cap (\text{SYMMETHIC}) = - .22045$$

ETA SURD = .22940 WITH VAR014 DEPENDENT.

= .22666 WITH VARIANCE DEPENDENT.

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NUMBER OF MISSING OBSERVATIONS = 69

CROSS TABULATIONS

08/28/77. PAGE 56

FILE DATA1 (CREATION DATE = 08/28/77.)

***** C R O S S T A B U L A T I O N O F *****
 VAR014 ROAT MOONED AT ENTRY ***** IN A GROUP OF ROATS *****
 ***** PAGE 1 OF 1

VAR020					
	COUNT		NO	ROW	
	ROW	COL		PCT	TOTAL
	PCT	PCT			
	TOT	TOT		1	2
VAR014	----- ----- ----- ----- ----- -----				
YES	1	232	513	745	
		31.1	68.9	53.3	
		48.5	55.8		
NO		16.6	36.7		
	-	----- ----- ----- ----- ----- -----			
	2	246	407	653	
		37.7	62.3	46.7	
		51.5	44.2		
		17.6	29.1		
	-	----- ----- ----- ----- ----- -----			
COLUMN		478	920	1398	
TOTAL		34.2	65.8	100.0	

CORRECTED CHI SQUARE = 6.31022 WITH 1 DEGREE OF FREEDOM. SIGNIFICANCE = .0120

PHI = .06870

CONTINGENCY COEFFICIENT = .06853

LAMBDA (ASYMMETRIC) = .02144 WITH VAR014 DEPENDENT.

LAMBDA (SYMMETRIC) = .01238

UNCERTAINTY COEFFICIENT (ASYMMETRIC) = .00341 WITH VAR014 DEPENDENT.

UNCERTAINTY COEFFICIENT (SYMMETRIC) = .00354

KENDALL'S TAU B = -.06870. SIGNIFICANCE = .0051

KENDALL'S TAU C = -.06503. SIGNIFICANCE = .0051

GAMMA = -.14402

SOMERS'S D (ASYMMETRIC) = -.07225 WITH VAR014 DEPENDENT.

SOMERS'S D (SYMMETRIC) = -.06861

ETA SQRD = .06870 WITH VAR014 DEPENDENT.

ETA SQRD = .06870 WITH VAR020 DEPENDENT.

NUMBER OF MISSING OBSERVATIONS = 66

CROSS TABULATIONS

08/28/77. PAGE 56

FILE DATA (CREATION DATE = 08/28/77.)

***** C R O S S T A B U L A T I O N D.F. *****
 VAR014 ROAT MOVED AT ENTRY ***** BY VAR047 ROATS IN GROUP ***** PAGE 1 OF 1

		COUNT				ROW	
		ROW	PCT	12	3 TO 6	7 OR MOR	TOTAL
		COL	PCT	1	2	F	
		TOT	PCT	1	2	3	
VAR014							
YES	1	152	70	9	231		
		65.8	30.3	3.9	48.6		
		54.7	43.2	25.7			
		32.0	14.7	1.9			
2		126	92	26	244		
NO	1	51.6	37.7	10.7	51.4		
		45.3	56.8	74.3			
		26.5	19.4	5.5			
		278	162	35	475		
TOTAL		58.5	34.1	7.4	100.0		

RAW CHI SQUARE = 13.33065 WITH 2 DEGREES OF FREEDOM. SIGNIFICANCE = .0013

CRAMER'S V = .16752

CONTINGENCY COEFFICIENT = .16522

LAMHDA (ASYMMETRIC) = .11255 WITH VAR014 DEPENDENT.

LAMHDA (SYMMETRIC) = .06075

UNCERTAINTY COEFFICIENT (ASYMMETRIC) = .02081 WITH VAR014 DEPENDENT.

UNCERTAINTY COEFFICIENT (SYMMETRIC) = .01842

KENDALL'S TAU B = .15376. SIGNIFICANCE = .0003

KENDALL'S TAU C = .15910. SIGNIFICANCE = .0003

GAMMA = .29386

SOMERS'S D (ASYMMETRIC) = .14849 WITH VAR014 DEPENDENT.

SOMERS'S D (SYMMETRIC) = .15366

ETA SORD = .16752 WITH VAR014 DEPENDENT.

ETA SORD = .16591 WITH VAR047 DEPENDENT.

NUMBER OF MISSING OBSERVATIONS = 989

CROSS TABULATIONS

08/28/77. PAGE 60

FILE DATA (CREATION DATE = 08/28/77.)

***** C R O S S T A B U L A T I O N O F *****
 VAR019 DAYS IN TRANSIT MY VAR020 IN A GROUP OF ROATS *****
 ***** PAGE 1 OF 1

		COUNT		VAR020		NO		ROW	
		ROW PCT		COL PCT		TOTAL		TOTAL	
VAR019		1		2		1		2	
ONE DAY	1	66	337	403					
		16.4	83.6	28.4					
		13.4	36.4						
TWO DAYS	2	113	147	260					
		43.5	56.5	18.3					
		22.9	15.9						
THREE OR MORE	3	315	441	756					
		41.7	58.3	53.3					
		63.8	47.7						
TOTAL		494	925	1419					
TOTAL		34.8	65.2	100.0					

RAW CHI SQUARE = 84.57451 WITH 2 DEGREES OF FREEDOM. SIGNIFICANCE = .0000
 CRAMER'S V = .24411
 CONTINGENCY COEFFICIENT = .23717
 LAMBDA (ASYMMETRIC) = 0 WITH VAR019 DEPENDENT. = 0 WITH VAR020 DEPENDENT.
 LAMBDA (SYMMETRIC) = 0
 UNCERTAINTY COEFFICIENT (ASYMMETRIC) = .03224 WITH VAR019 DEPENDENT. = .05008 WITH VAR020 DEPENDENT.
 UNCERTAINTY COEFFICIENT (SYMMETRIC) = .03923
 KENDALL'S TAU B = -.19364. SIGNIFICANCE = .0000
 KENDALL'S TAU C = -.20243. SIGNIFICANCE = .0000
 GAMMA = -.16499
 SOMERS'S D (ASYMMETRIC) = -.22300 WITH VAR019 DEPENDENT.
 SOMERS'S D (SYMMETRIC) = -.19173
 ETA SQRD = .21472 WITH VAR019 DEPENDENT.
 = .24413 WITH VAR020 DEPENDENT.

NUMBER OF MISSING OBSERVATIONS = 45

APPENDIX C

REGRESSION ANALYSIS

CORRELATION BETWEEN PLEASURE BOATS THROUGH
THE LOCKS AND VARIOUS FACTORS

Multiple regression analyses were utilized to test the relationship between selected variables and the number of pleasure boats passing through the 28 locks on the Upper Mississippi River (1976). The variables (x_1 through x_{11}) are shown in Table C-1. These variables are explained in the body of the report. The SPSS program outputs from the regression analysis follows Table C-1. It may be noted that two separate flow factors were utilized. Flow I is in terms of lock flow averages; Flow II is in terms of regional flow averages. The model containing the regional flow averages accounted for slightly more variance than the model utilizing lock flow averages.

The variables are listed as follows:

- Y = Pleasure boats through the locks
- x_1 = Commercial marina slips (above and below the lock)
- x_2 = Flow factors
 - I. Lock flow averages
 - II. Regional flow averages
- x_3 = Commercial lockages
- x_4 = Miles to next lock (above and below the lock)
- x_5 = Recreation quality of pools (above and below the lock)
- x_6 = Commercial marina slips (upstream)
- x_7 = Commercial marina slips (downstream)
- x_8 = Miles to next lock (upstream)
- x_9 = Miles to next lock (downstream)
- x_{10} = Recreation quality of pool (upstream)
- x_{11} = Recreation quality of pool (downstream)

TABLE C-1

REGRESSION VARIABLES (PLEASURE BOATS THROUGH THE LOCKS VS. SELECTED VARIABLES)

Lock Number	Y	x ₁	x ₂ (I)	$\frac{a}{x_2(II)}$	x ₃	x ₄	x ₅	$\frac{b}{x_5}$	x ₆	x ₇	x ₈	x ₉	x ₁₀	$\frac{b}{x_{10}}$	x ₁₁	$\frac{b}{x_{11}}$
Variable																
SPSS Variables	1	2	12(I)	12(II)	3	4	5	6	7	8	9	10	11			
51	1,580	0	0.97	0.97	2,443	0.3	2.08	0	0	0	0	0.5	1.07	1.01		
52	1,491	0	0.97	0.97	2,596	3.0	2.23	0	0	0	0.5	5.5	1.01	1.22		
1	3,366	497	0.97	0.97	2,815	19.0	3.91	0	497	5.5	32.5	1.22	2.69	5.83		
2	7,848	2,059	0.59	0.97	2,295	25.4	8.51	497	1,562	32.5	18.3	2.69	5.83	11.01		
3	10,947	2,894	0.70	0.97	2,058	31.3	16.84	1,562	1,332	18.3	44.3	5.83	11.01	6.41		
4	7,199	1,344	0.97	0.97	2,100	29.4	17.42	1,332	12	44.3	14.5	11.01	6.41	5.36		
5	6,189	92	1.24	0.97	2,153	12.1	11.77	12	80	14.5	9.8	6.41	5.36	6.22		
5A	8,114	627	0.97	0.97	2,200	12.0	11.58	80	547	9.8	14.3	5.36	6.22	7.77		
6	6,494	593	0.97	0.97	2,218	13.0	13.98	547	46	14.3	11.8	6.22	7.77	9.48		
7	9,939	955	1.06	0.97	2,628	17.5	17.25	46	909	11.8	23.3	7.77	9.48	11.45		
8	5,694	1,125	0.97	0.97	2,235	27.3	20.93	909	216	23.3	31.3	9.48	11.45	10.69		
9	6,913	1,001	0.97	0.97	2,688	32.1	22.13	216	785	31.3	33.0	11.45	10.69	7.74		
10	10,024	1,007	1.26	0.97	2,448	32.5	18.42	785	222	33.0	32.0	10.69	7.74	5.66		
11	7,078	1,299	0.94	1.05	2,478	29.1	13.40	222	1,077	32.0	26.3	7.74	5.66	10.58		
12	4,929	1,278	1.26	1.05	2,926	30.3	16.24	1,077	201	26.3	34.3	10.58	6.47	3.34		
13	6,840	828	0.81	1.05	2,511	31.7	17.05	201	627	34.3	29.3	6.47	3.34	7.55		
14	9,713	945	0.98	1.05	3,693	19.8	9.81	627	318	29.3	10.3	3.34	7.55	6.02		
15	6,782	783	1.05	1.05	4,032	18.0	10.88	318	465	10.3	25.8	7.55	6.02	7.99		
16	2,355	555	1.05	1.05	3,787	23.0	13.57	465	90	25.8	20.3	6.02	7.99	5.75		
17	2,339	186	1.05	1.05	3,505	23.4	14.01	90	96	20.3	26.5	5.75	3.75	6.81		
18	2,663	397	1.05	1.05	3,781	36.4	13.73	96	301	26.5	46.3	7.99	5.75	5.86		
19	1,425	399	1.05	1.05	2,659	33.6	9.50	301	98	46.3	21.0	3.75	6.81	5.69		
20	1,170	348	1.05	1.05	4,051	19.6	10.56	98	250	21.0	18.3	6.81	5.69	6.29		
21	1,706	366	1.05	1.05	4,271	21.0	12.50	250	116	18.3	23.8	5.69	5.86	9.34		
22	1,453	217	1.05	1.05	4,169	25.8	11.54	116	101	23.8	27.8	32.0	5.86	6.29		
24	1,682	244	1.05	1.05	4,270	29.9	12.14	101	143	27.8	32.0	5.86	6.29	9.34		
25	2,638	2,299	1.05	1.05	4,317	35.3	15.63	143	2,156	32.0	38.5	6.29	9.34	9.34 ^d		
26	632	2,156	1.05	1.05	13,726	38.5	18.67 ^c	2,156	0	38.5	18.0	9.34	9.34 ^d			

a/ Recreation lockage survey data (origin explained in the body of the report).

b/ Development of the quality rating explained in the report.

c/ Quality of Pool 26 doubled.

d/ Downstream quality same as Pool 26.

CORRELATION BETWEEN PLEASURE BOATS THROUGH
THE LOCKS AND VARIOUS FACTORS

1. Flow I Lock Flow Averages
2. Flow II - Regional Flow Averages

FLOW I

LOCK FLOW AVERAGES

UNITED COMPUTING SYSTEMS, INC.
 S P S - STATISTICAL PACKAGE FOR THE SOCIAL SCIENCES
 VERSION 6.5 - Sept. 1, 1976

HUM NAME LOCK REGRESSION
 FILE NAME LOCK123
 VARIABLE LIST VAR01 TO VAR12
 INPUT METHOD CARD
 N OF CASES 28
 INPUT FORMAT FIXED(5X,3(F5.0),F5.1,F5.2,2(F5.0),2(F5.1),3(F5.2))

ACCORDING TO YOUR INPUT FORMAT, VARIABLES ARE TO BE READ AS FOLLOWS

VARIABLE	FORMAT	RECORD	COLUMNS
VAR01	F 5. 0	1	6- 10
VAR02	F 5. 0	1	11- 15
VAR03	F 5. 0	1	16- 20
VAR04	F 5. 1	1	21- 24
VAR05	F 5. 2	1	26- 30
VAR06	F 5. 0	1	31- 35
VAR07	F 5. 0	1	36- 40
VAR08	F 5. 1	1	41- 45
VAR09	F 5. 1	1	46- 50
VAR10	F 5. 2	1	51- 55
VAR11	F 5. 2	1	56- 60
VAR12	F 5. 2	1	61- 65

THE INPUT FORMAT PROVIDES FOR 12 VARIABLES. 12 WILL BE READ
 IT PROVIDES FOR 1 RECORDS (*CARDS*) PER CASE. A MAXIMUM OF 65 *COLUMNS* ARE USED ON A RECORD.

VAR LABELS VAR01,ROATS/VAR02,SLIP-B/VAR03,COMML/VAR04,MILES-R/
 VAR05,QUAL/VAR06,SLIPUP/VAR07,SLIPDOWN/VAR08,MILESUP/
 VAR09,MILESDOWN/VAR10,QUALUP/VAR11,QUALDOWN/VAR12,FLOW1
 REGRESSION VARIABLES=VAR01 TO VAR12/
 REGRESSION=VAR01 WITH VAR02 TO VAR12(1) RESID = 0
 OPTIONS 2.13
 STATISTICS 1.2
 READ INPUT DATA

054200 CM NEEDED FOR REGRESSION

05/16/78. PAGE 3

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----- VARIABLES NOT IN THE

TOLERANCE

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LOCK REGRESSION

FILE LOCK123 (CREATION DATE = 05/16/78.)

05/16/78.

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***** MULTIPLE REGRESSION *****

DEPENDENT VARIABLE.. VAR01

ROATS

VARIABLE(S) ENTERED ON STEP NUMBER 2.. VAR02 SLIP-R

MULTIPLE R .71039 ANALYSIS OF VARIANCE DF SUM OF SQUARES MEAN SQUARE F SIGNIFICANCE
R SQUARE .50465 REGRESSION 2. 141944342.96937 70972171.48469 12.73472 .000
ADJUSTED R SQUARE .46502 RESIDUAL 25. 139328071.99492 5573122.87980
STD DEVIATION 2360.74625 COEFF OF VARIABILITY 47.5 PCT

----- VARIABLES IN THE EQUATION -----

----- VARIABLES NOT IN THE EQUATION -----

VARIABLE	R	STD ERROR R	F	SIGNIFICANCE	BETA	ELASTICITY	VARIABLE	PARTIAL	TOLERANCE	F	SIGNIFICANCE
VAR03	-.85660793	.21515782	15.850754	.001	-.5769068	VAR04	-.15410	.65131		.58377759	
VAR02	2.5127332	.63407285	15.664597	.001	-.58492	VAR05	.30595	.76491		2.4705042	.129
(CONSTANT)	5881.2229	921.09816	38.042744	.000	.44217	VAR06	.22505	.41565		1.2803376	.269
						VAR07	-.222495	.41560		1.2791323	.269
						VAR08	-.87976	.80276		.15363932	.699
						VAR09	-.19582	.83729		.95702667	.338
						VAR10	.36011	.91967		3.5759575	.071
						VAR11	.15223	.65392		.56934492	.458
						VAR12	.12841	.74465		.40234435	.532

LOCK REGRESSION

FILE LOCK123 (CREATION DATE = 05/16/78.)

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***** MULTIPLE REGRESSION *****

DEPENDENT VARIABLE.. VAR01 ROATS

VARIABLE(S) ENTERED ON STEP NUMBER 1.. VAR10 QUALUP

MULTIPLE R	.75425	ANALYSIS OF VARIANCE	DF	SUM OF SQUARES	MEAN SQUARE	F	SIGNIFICANCE
R SQUARE	.56889	REGRESSION	3.	160011939.21473	53337313.07158	10.55658	.000
ADJUSTED R SQUARE	.51500	RESIDUAL	24.	121260875.74956	5052519.82290		
STD DEVIATION	2247.78109	COEFF OF VARIABILITY	45.2 PCT				

----- VARIABLES IN THE EQUATION -----

VARIABLE	H	STD ERROR B	F	SIGNIFICANCE	BETA	ELASTICITY	VARIABLE	PARTIAL	TOLERANCE	F	SIGNIFICANCE
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VAR03	-.88666576	.20547792	18.620424	.000	-.5971501		VAR04	-.50924	.40601	8.0527928	.009
VAR02	2.2171218	.6243790A	12.609053	.002	-.60545		VAR05	-.04594	.14369	.48644857E-01	.827
VAR10	294.66494	155.82326	3.4759575	.071	.39015		VAR06	.13370	.37976	.41864160	.524
(CONSTANT)	4157.6024	1100.941A	12.187226	.002	.37901		VAR07	-.13359	.37971	.41790445	.524
							VAR08	-.41773	.49009	.4.8619626	.038
							VAR09	-.32554	.77689	2.7263967	.112
							VAR11	-.04548	.47495	.47674981E-01	.829
							VAR12	.01456	.66799	.48798285E-02	.945

LOCK REGRESSION

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FILE LOCK123 (CREATION DATE = 05/16/78.)

***** MULTIPLE REGRESSION *****

DEPENDENT VARIABLE.. VAR01 ROATS

VARIABLE(S) ENTERED ON STEP NUMBER 4.. VAR04 MILES-B

MULTIPLE R	.82504	ANALYSIS OF VARIANCE	DF	SUM OF SQUARES	MEAN SQUARE	F	SIGNIFICANCE
R SQUARE	.68069	REGRESSION	4.	191457918.81518	47864479.70380	12.25730	.000
ADJUSTED R SQUARE	.62515	RESIDUAL	23.	89814496.14910	3904978.09344		
STD DEVIATION	1976.10174	COEFF OF VARIABILITY	39.7 PCT				

VARIABLES IN THE EQUATION

VARIABLES NOT IN THE EQUATION

VARIABLE	B	STD ERROR B	R	F	MEIA	VARIABLE	PARTIAL	TOLERANCE	F	SIGNIFICANCE
VAR03	-.74631834	.18729074	15.878724	-.5026292	VAR05	-.02897	.14345	.18481848E-01		
VAR02	3.9599466	.62411353	24.038120	-.50961	VAR06	.03582	.36407	.28261825E-01		
VAR10	596.82402	173.50459	11.832340	.53847	VAR07	-.03580	.36405	.28224854E-01		
VAR04	-174.62522	61.536629	8.0527928	.76767	VAR08	-.12224	.27285	.33374179		
(CONSTANT)	5192.8104	1108.6374	21.932682	-.84087	VAR09	.09812	.34092	.21385857		
			.000		VAR11	-.02814	.47412	.17440451E-01		
					VAR12	.05649	.66503	.70429399E-01		
								.793		

LOCK REGRESSION

FILE LOCK123 (CREATION DATE = 05/16/78.)

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***** MULTIPLE REGRESSION *****

DEPENDENT VARIABLE.. VAR01 R0ATS

VARIABLE(S) ENTERED ON STEP NUMBER 5.. VAR04 MILESUP

MULTIPLE R .92792 ANALYSIS OF VARIANCE DF SUM OF SQUARES MEAN SQUARE F SIGNIFICANCE
R SQUARE .68546 REGRESSION 5. 19280051.77527 38560010.35505 9.58853
ADJUSTED R SQUARE .61397 RESIDUAL 22. 88472363.18902 4021471.05405
STD DEVIATION 2005.36058 COEFF OF VARIABILITY 40.3 PCT

----- VARIABLES IN THE EQUATION -----

VARIABLE	H	STD ERROR B	F	SIGNIFICANCE	BETA	ELASTICITY
VAR03	-.75067593	.19021345	15.574802	.001	-.5055639	-.4278923
VAR02	3.0391965	.63437202	22.952476	.000	-.51259	-.68567
VAR10	627.07457	183.69493	11.653169	.002	.6936697	-.1323164
VAR04	-142.39228	83.740125	2.8914647	.103	.53482	-.16370
VAR08	-3.5490210	6.1433219	.33374179	.569	.80658	
(CONSTANT)	5073.7454	1143.5261	19.686348	.000		

----- VARIABLES NOT IN THE EQUATION -----

VARIABLE	PARTIAL	TOLERANCE	F	SIGNIFICANCE
VAR05	-.11471	.10095	.28002393	.602
VAR06	.05795	.35347	.70757582E-01	.793
VAR07	-.05792	.35346	.70686610E-01	.793
VAR09	-.12319	.01115	.32358202	.575
VAR11	-.11374	.33362	.27522352	.605
VAR12	.03816	.64883	.30631498E-01	.863

LOCK REGRESSION

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FILE LOCK123 (CREATION DATE = 05/16/78.)

***** MULTIPLE REGRESSION *****

DEPENDENT VARIABLE.. VAR01 R0ATS

VARIABLE(S) ENTERED ON STEP NUMBER 6.. VAR09 MILFSDM

MULTIPLE R .83080 ANALYSIS OF VARIANCE OF SUM OF SQUARES MEAN SQUARE F SIGNIFICANCE
R SQUARE .69023 REGRESSION 6. 194142606.03428 32357101.00571 7.79870 .000
ADJUSTED R SQUARE .60172 RESIDUAL 21. 87129808.93001 4149036.52044
STD DEVIATION 2034.91888 COEFF OF VARIABILITY 41.0 PCT

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----- VARIABLES IN THE EQUATION -----

----- VARIABLES NOT IN THE EQUATION -----

VARIABLE	H	STD ERROR B	F	BETA	ELASTICITY	VARIABLE	PARTIAL	TOLERANCE	F	SIGNIFICANCE
VAR03	-1.0737390	.59989484	3.2036657	-.7231398	VAR05	-.09749	.09851	.19190396		
VAR02	2.8401273	.73325433	15.082593	-.73319	VAR06	.00920	.29619	.16931918E-02		
VAR10	588.15976	198.73155	8.7590491	.6482339	VAR07	-.00918	.29621	.16867518E-02		
VAR04	258.56661	709.98480	.13263154	.49979	VAR11	-.09882	.32558	.18806998		
VAR08	-22.854322	34.506747	.43866062	.75652	VAR12	.05816	.63360	.67886279E-01		
VAR09	-189.35684	332.88084	.32358202	.7769881						
(CONSTANT)	5949.9265	1929.1494	9.5124297	1.24507						
			.575	-.8543271						
			.006	-.91085						

LOCK REGRESSION

FILE LOCK123 (CREATION DATE = 05/16/78.)

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***** MULTIPLE REGRESSION *****

DEPENDENT VARIABLE.. VAR01

ROATS

VARIABLE(S) ENTERED ON STEP NUMBER 7.. VAR05 QUAL

MULTIPLE R	.83257	ANALYSIS OF VARIANCE	DF	SUM OF SQUARES	MEAN SQUARE	F	SIGNIFICANCE
R SQUARE	.69317	REGRESSION	7.	194970688.17599	27852955.45371	6.45479	.000
ADJUSTED R SQUARE	.59578	RESIDUAL	20.	86301726.78830	4315086.33942		
STD DEVIATION	2077.27859	COEFF OF VARIABILITY	41.8 PCT				

VARIABLES IN THE EQUATION

VARIABLES NOT IN THE EQUATION

VARIABLE	B	STD ERROR B	F	SIGNIFICANCE	ELASTICITY	RETA	VARIABLE	PARTIAL	TOLERANCE	F	SIGNIFICANCE
VAR03	-1.0391493	.61685563	2.8378461	.104	-.6988444	VAR06		.02772	.28619	.16607239E-01	.905
VAR02	3.0432805	.87990995	11.962103	.002	-.70957	VAR07		-.02770	.28621	.14591690E-01	.905
VAR10	764.54212	450.76712	2.8767252	.105	.6857139	VAR11		.35576	.00000	2.7531237	.113
VAR04	227.07451	727.61253	.97394944E-01	.758	.6823548	VAR12		.08829	.58707	.14927596	.704
VAR08	-22.300398	35.213177	.40106504	.534	-1.02858						
VAR09	-165.96405	343.65082	.23323477	.634	-.5734928						
VAR05	-111.65221	254.87390	.19190396	.666	-.79833						
(CONSTANT)	6054.8996	1981.9134	9.3335000	.006	-.29379						

LOCK REGRESSION

FILE LOCK123 (CREATION DATE = 05/16/78.)

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DEPENDENT VARIABLE.. VAR01

VARIABLE(S) ENTERED ON STEP NUMBER R.. VAR12 FLOW1

MULTIPLE R .93401 ANALYSIS OF VARIANCE DF SUM OF SQUARES MEAN SQUARE F SIGNIFICANCE
R SQUARE .69557 REGRESSION 8. 195643443.27964 2445430.40995 5.42635 .001
ADJUSTED R SQUARE .56738 RESIDUAL 19. 85628971.68465 4506787.98340
STD DEVIATION 2122.91968 COEFF OF VARIABILITY 42.7 PCT

VARIABLES IN THE EQUATION

VARIABLE	B	STD ERROR B	F	SIGNIFICANCE	ELASTICITY	BETA	ELASTICITY
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VAR03	-1.0898295	.64391123	2.8646074	.107	-.7339765	VAR06	.01097	.27558	.21660893E-02
VAR02	3.2414682	1.0352602	9.8035755	.005	-.74418	VAR07	-.01097	.27562	.21647383E-02
VAR10	783.90522	463.38925	2.4617732	.107	.7398364	VAR11	.38190	.00000	3.0734431
VAR04	259.19316	748.23172	.11999823	.733	.57041				.097
VAR08	-23.943643	36.237322	.43658444	.517	.7030806				
VAR09	-101.61763	353.53061	.26391371	.613	1.00830				
VAR05	-139.98630	270.60071	.26761672	.611	.7788708				
VAR12	1472.5296	3011.2646	.14927596	.704	1.24809				
(CONSTANT)	4802.2266	3822.8902	1.5779805	.224	-.6275841				

VARIABLES NOT IN THE EQUATION

VARIABLE	PARTIAL	TOLERANCE	F	SIGNIFICANCE
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F-LEVEL OR TOLERANCE-LEVEL INSUFFICIENT FOR FURTHER COMPUTATION.

LOCK REGRESSION

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FILE LOCK123 (CREATION DATE = 05/16/78.)

***** MULTIPLE REGRESSION *****

DEPENDENT VARIABLE.. VAR01 ROATS

SUMMARY TABLE

STEP	VARIABLE ENTERED REMOVED	F TO ENTER OR REMOVE	SIGNIFICANCE	MULTIPLE R	R SQUARE	R SQUARE CHANGE	SIMPLE R	OVERALL F	SIGNIFICANCE
1	VAR03	6.26899	.019	.44076	.19427	.19427	-.44076	6.26899	.019
2	VAR02	15.66460	.001	.71039	.50465	.31038	.43656	12.73472	.000
3	VAR10	3.57596	.071	.75425	.56889	.06424	.32075	16.55658	.000
4	VAR04	8.05279	.009	.82504	.68069	.11180	.03324	12.25730	.000
5	VAR08	.33374	.569	.82792	.68546	.00477	.04819	9.58853	.000
6	VAR09	.32358	.575	.83080	.69023	.00477	.10005	7.79870	.000
7	VAR05	.19190	.666	.83257	.69317	.00294	.36852	9.49479	.000
8	VAR12	.14928	.704	.83401	.69557	.00239	-.26081	5.42635	.001

FLOW II

REGIONAL FLOW AVERAGES

UNITED COMPUTING SYSTEMS INC.
 S P S - STATISTICAL PACKAGE FOR THE SOCIAL SCIENCES
 VERSION 6.5 - - SEPT. 1, 1976

RUN NAME LOCK REGRESSION
 FILE NAME LCKR123
 VARIABLE LIST VAR01 TO VAR12
 INPUT METHOD CARD
 NO OF CASES 20
 INPUT FORMAT FIXED(5,1)F5,0)F5,2)F5,0)F5,1)F5,2)F5,2)

ACCORDING TO YOUR INPUT FORMAT. VARIABLES ARE TO BE READ AS FOLLOWS

VARIABLE	FORMAT	RECORD	COLUMNS
VAR01	F 5, 0	1	6- 10
VAR02	F 5, 0	1	11- 15
VAR03	F 5, 0	1	16- 20
VAR 4	F 5, 1	1	21- 25
VAR05	F 5, 2	1	26- 30
VAR06	F 5, 0	1	31- 35
VAR07	F 5, 0	1	36- 40
VAR08	F 5, 1	1	41- 45
VAR09	F 5, 1	1	46- 50
VAR10	F 5, 2	1	51- 55
VAR11	F 5, 2	1	56- 60
VAR12	F 5, 2	1	66- 70

THE INPUT FORMAT PROVIDES FOR 12 VARIABLES. 12 WILL BE READ
 IT PROVIDES FOR 1 RECORDS (CARDS*) PER CASE. A MAXIMUM OF 70 *COLUMNS* ARE USED ON A RECORD.

VAR LABELS VAR01=ROATS/VAR02=SLIP-R/VAR03=COMML/VAR04=MILES-B/
 VAR05=QUAL/VAR06=SLIPUP/VAR07=SLIPDN/VAR08=MILESUP/
 VAR09=MILESDN/VAR10=QUALUP/VAR11=QUALDN/VAR12=FLOW
 REGRESSION VARIABLE5=VAR01 TO VAR12/
 REGRESSION=VAR01 WITH VAR02 TO VAR12(1) RESID = 0
 OPTIONS 2.13
 STATISTICS 1.2
 READ INPUT DATA

056200 (14 REEDED FOR REGRESSION)

FILE LOCK123 (CREATION DATE = 05/17/79.)

MULTIPLE REGRESSION

VARIABLE	MEAN	STANDARD DEV	CASES
VAR01	4971.5357	3227.6147	2A
VAR02	874.8571	736.6745	2A
VAR03	3394.7500	2173.1283	2A
VAR04	23.3393	9.6980	2A
VAR05	13.0814	4.9874	2A
VAR06	437.3929	535.2020	2A
VAR07	437.3929	535.2020	2A
VAR08	229.3071	120.3335	2A
VAR09	23.9143	11.1531	2A
VAR10	6.3966	2.8964	2A
VAR11	6.6980	2.7407	2A
VAR12	1.0129	.0406	2A

CORRELATION COEFFICIENTS.

A VALUE OF 99.0000 IS PRINTED
IF A COEFFICIENT CANNOT BE COMPUTED.

	VAR01	VAR02	VAR03	VAR04	VAR05	VAR06	VAR07	VAR08	VAR09	VAR10	VAR11
VAR02	.43656										
VAR03	-.44076	.23739									
VAR04	.03324	.55059	.33801								
VAR05	.36852	.48186	.16687	.47713							
VAR06	.21621	.68828	.48647	.46395	.49527						
VAR07	.30484	.60820	-.15977	.29388	.16803						
VAR08	.08319	.41804	.24487	.83830	.55991	.43884	.13857				
VAR09	.10005	.39106	.30127	.73664	.51075	.11572	.42250	.29424			
VAR10	.32075	.27348	.13720	.64142	.89164	.39466	-.01820	.66173	.33527		
VAR11	.33208	.58795	.15904	.55587	.87906	.48886	.32846	.30308	.57564	.56798	
VAR12	-.47028	-.09126	.44464	.42340	.04390	-.04006	-.07111	.36537	.26014	.07357	.00239

LOCK REGRESSION

05/17/78. PAGE 3

FILE LOCK123 (CREATION DATE = 05/17/78.)

..... MULTIPLE REGRESSION

DEPENDENT VARIABLE.. VAR01

ROATS

MEAN RESPONSE 4971.53571 STD. DEV. 3227.41473

VARIABLE(S) ENTERED ON STEP NUMBER 1.. VAR12 FLOW2

MULTIPLE R	.47028	ANALYSIS OF VARIANCE	DF	SUM OF SQUARES	MEAN SQUARE	F	SIGNIFICANCE
R SQUARE	.22075	REGRESSION	1.	64340515.93749	64340515.93749	7.71142	.010
ADJUSTED R SQUARE	.19904	RESIDUAL	26.	216931899.02680	8343534.57795		
STD DEVIATION	2844.51771	COEFF OF VARIABILITY	58.1	PCT			

----- VARIABLES IN THE EQUATION -----

VARIABLE	B	STD ERROR B	F	RETA	ELASTICITY
VAR12	-37993.910	13681.911	7.7114220	-.4702761	
(CONSTANT)	43453.939	13868.568	9.8173671	-7.74055	

----- VARIABLES NOT IN THE EQUATION -----

VARIABLE	PARTIAL	TOLERANCE	F	SIGNIFICANCE
VAR02	.45435	.99340	6.5033856	
VAR03	-.28996	.80226	2.2948939	
VAR04	.29630	.82074	2.4061311	
VAR05	.44397	.99807	6.1374729	
VAR06	.22412	.99833	1.3222102	
VAR07	.40050	.99494	4.7760575	
VAR08	.20690	.85149	2.2424426	
VAR09	.26471	.93233	1.8837913	
VAR10	.40639	.99459	4.257006	
VAR11	.37944	.99999	4.2046554	

LOCK REGRESSION

FILE LOCK123 (CREATION DATE = 05/17/78.)

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***** MULTIPLE REGRESSION *****

DEPENDENT VARIABLE.. VAR01

VARIABLE(S) ENTERED ON STEP NUMBER 2.. VAR02 SLIP-R

MULTIPLE R .62287 ANALYSIS OF VARIANCE DF SUM OF SQUARES MEAN SQUARE F SIGNIFICANCE
R SQUARE .38796 REGRESSION 2. 109122743.60411 54561371.80205 7.92354 .002
ADJUSTED R SQUARE .33900 RESIDUAL 25. 172149671.36018 6885986.85441
STD DEVIATION 2624.11639 COEFF OF VARIABILITY 52.8 PCI

----- VARIABLES IN THE EQUATION -----

VARIABLE	H	STD ERROR R	F	BETA	ELASTICITY	VARIABLE	PARTIAL	TOLERANCE	F	SIGNIFICANCE
----------	---	-------------	---	------	------------	----------	---------	-----------	---	--------------

VAR12	-35409.858	12170.774	8.0622573	-.4457450		VAR03	-.50611	.72695	8.2642938	
VAR02	1.7540175	.68780316	6.5033856	-.721405		VAR04	.00286	.47624	.19658447E-03	.008
(CONSTANT)	39301.946	12703.867	9.5709766	.30866		VAR05	.28603	.76086	2.1383930	.989
			.005			VAR06	-.13868	.52604	.4568989	.157
						VAR07	.13676	.52604	.45743299	.506
						VAR08	.00352	.64823	.16458790	.505
						VAR09	.08789	.76129	.18343495	.685
						VAR10	.32595	.91597	2.8530024	.612
						VAR11	.15479	.65179	.58919007	.104
									.450	

LOCK REGRESSION

05/17/78. PAGE 5

FILE LOCK123 ICHEATION DATE = 05/17/78.)

***** MULTIPLE REGRESSION *****

DEPENDENT VARIABLE.. VAR01 RATS

VARIABLE(S) ENTERED ON STEP NUMBER 1.. VAR03 COMML

MULTIPLE R	.73806	SUM OF SQUARES	MEAN SQUARE	F	SIGNIFICANCE
R SQUARE	.54473	153217787.72065	51072595.90688	9.57203	.000
ADJUSTED R SQUARE	.48782	124054627.24364	5335609.46849		
STD DEVIATION	2309.89382	46.5 PCT			

VARIABLES IN THE EQUATION				VARIABLES NOT IN THE EQUATION					
VARIABLE	B	STD ERROR B	F	SIGNIFICANCE	ELASTICITY	BETA	SIGNIFICANCE		
VAR12	-18179.887	12507.019	2.1128802	.159	-.2288526	VAR04	-.00799	.47607	.1468251E-02
VAR02	2.3142272	.63603124	13.238998	.001	-3.70381	VAR05	.34234	.76061	3.0532935
VAR03	-.68953332	.23985699	8.2642938	.008	.60124	VAR06	.16454	.38864	.63999828
(CONSTANT)	23781.339	12429.850	3.6359169	.069	-.47084	VAR07	-.16446	.38862	.63938811
						VAR08	.05405	.64476	.67401063E-01
						VAR09	-.08671	.68697	.17424393
						VAR10	.39796	.91493	4.3280190
						VAR11	.17610	.65176	.73610198
									.400

LOCK REGRESSION

05/17/78. PAGE 6

FILE LOCK123 (CREATION DATE = 05/17/78.)

***** MULTIPLE REGRESSION *****

DEPENDENT VARIABLE.. VAR01 R2=0.815

VARIABLE(S) ENTERED ON STEP NUMBER 4.. VAR10 QUALUP

MULTIPLE R .78539
R SQUARE .61643
ADJUSTED R SQUARE .55020
STD DEVIATION 2164.67429

ANALYSIS OF VARIANCE
REGRESSION 4. 173496176.73289
RESIDUAL 23. 107774238.23140
COEFF OF VARIABILITY 43.5 PCI

MEAN SQUARE
43374544.18322
4685836.44484
F 9.25652
SIGNIFICANCE .000

----- VARIABLES IN THE EQUATION -----

VARIABLE	H	STD ERROR B	F	BETA	ELASTICITY	SIGNIFICANCE
VAR12	-19935.689	11751.124	2.8740854	-.2509551	-.2509551	VAR04
VAR02	1.9010539	.61718640	.103	-.406152	-.406152	VAR05
VAR03	-.70532512	.22490620	.784	.34861	.34861	VAR06
VAR10	312.99645	158.45092	.005	-.4750211	-.4750211	VAR07
(CONSTANT)	23823.304	11648.579	.049	.2807249	.2807249	VAR08
			.052	.40259	.40259	VAR09
						VAR11

----- VARIABLES NOT IN THE EQUATION -----

VARIABLE	PARTIAL	TOLERANCE	F	SIGNIFICANCE
VAR04	-.40974	.25853	4.4387969	.047
VAR05	-.04037	.14361	.35904345E-01	.851
VAR06	.04116	.34792	.37338635E-01	.849
VAR07	-.04108	.34791	.37188463E-01	.849
VAR08	-.30504	.36173	2.2571115	.147
VAR09	-.21652	.63924	1.0821371	.310
VAR11	-.04001	.47470	.35274652E-01	.853

LOCK REGRESSION

FILE LOCK123 (CHARTION DATE = 05/17/78.)

05/17/78. PAGE 7

***** MULTIPLE REGRESSION *****
DEPENDENT VARIABLE.. VAR01 H0ATS

VARIABLE(S) ENTERED ON STEP NUMBER 5.. VAR04 MILES-R

MULTIPLE R .42533
R SQUARE .60116
ADJUSTED R SQUARE .60870
STD DEVIATION 2019.00148

ANALYSIS OF VARIANCE
REGRESSION 5. 101592341.72343
RESIDUAL 22. 89680073.24046
COEFF OF VARIABILITY 40.6 PCT

MEAN SQUARE
103184468.34476
4076366.96548

F SIGNIFICANCE
9.40015 .000

----- VARIABLES IN THE EQUATION -----

VARIABLE	B	STD ERROR B	F	ELASTICITY	RETA	VARIABLE	PARTIAL	TOLERANCE	F	SIGNIFICANCE
VAR02	-2494.2569	13735.305	.32976154E-01	-.0313963	-.0313963	VAR05	-.02805	.14345	.17739929E-01	.895
VAR03	2.9887893	.74043801	15.946998	-.50816	-.50816	VAR06	.02822	.34743	.16738404E-01	.898
VAR04	-.73056071	.21011223	12.089545	.52595	.52595	VAR07	-.02820	.34742	.16711514E-01	.898
(CONSTANT)	7601.4050	13316.338	.32585031	-.49885	-.49885	VAR08	-.11719	.26320	.29242855	.594
			.574	.5239624	.5239624	VAR09	.09611	.33970	.19580626	.663
				.75142	.75142	VAR11	-.02824	.47412	.16781273E-01	.898

----- VARIABLES NOT IN THE EQUATION -----

VARIABLE	B	STD ERROR B	F	ELASTICITY	RETA	VARIABLE	PARTIAL	TOLERANCE	F	SIGNIFICANCE
VAR01										

LOCK REGRESSION

05/17/79. PAGE 8

FILE LOCK123 (CREATION DATE = 05/17/79.)

***** MULTIPLE REGRESSION *****

DEPENDENT VARIABLE.. VAR01 ROADTS

VARIABLE(S) ENTERED ON STEP NUMBER 4.. VAR04 MILESHP

MULTIPLE R .82797 ANALYSIS OF VARIANCE DF SUM OF SQUARES MEAN SQUARE F SIGNIFICANCE
W SQUARE .88554 REGRESSION 6. 19282086.84734 3213733.67456 7.63026 .000
ADJUSTED R SQUARE .59570 RESIDUAL 21. 88448416.11694 4211829.24366
STD DEVIATION 2052.27416 COEFF OF VARIABILITY 41.3 PCT

----- VARIABLES IN THE EQUATION -----

VARIABLE	H	STD ERROR B	F	ETA	ELASTICITY	VARIABLE	PARTIAL	TOLERANCE	F	SIGNIFICANCE
VAR12	-1071.3614	14207.541	.58861451E-02	-.0134863	-.21827	VAR05	-.11357	.09989	.26134816	.615
VAR02	3.0091552	.76170372	15.606914	.6868131	.52953	VAR06	.05560	.33078	.62023314E-01	.806
VAR03	-.74379796	.21497306	11.971316	-.5009317	-.50789	VAR07	-.05557	.33077	.61956452E-01	.806
VAR10	620.88894	205.10996	9.1633512	.5568721	.79862	VAR09	-.15632	.08569	.50697099	.487
VAR04	-139.50168	93.892736	2.2074702	-.4192000	-.87174	VAR11	-.11259	.32886	.25680396	.614
VAR08	-3.4596731	6.3977192	.29242855	-.1289053	-.15957					
(CONSTANT)	6171.6138	13813.304	.19575671	.594	.663					

----- VARIABLES NOT IN THE EQUATION -----

LOCK REGRESSION

05/17/78. PAGE 9

FILE LOCK123 (CREATION DATE = 05/17/78.)

***** MULTIPLE REGRESSION *****

DEPENDENT VARIABLE.. VAR01

VARIABLE(S) ENTERED ON STEP NUMBER 7.. VAR09 MILESOWN

MULTIPLE R .43260 ANALYSIS OF VARIANCE DF SUM OF SQUARES MEAN SQUARE F SIGNIFICANCE
R SQUARE .49323 REGRESSION 7. 194985366.24242 27855052.32035 6.45637 .000
ADJUSTED R SQUARE .45486 RESIDUAL 20. 86287048.72187 4314352.43609
STD DEVIATION 2077.10193 COEFF OF VARIABILITY 41.9 PCT

----- VARIABLES IN THE EQUATION -----

VARIABLE	H	STD ERROR B	F	ELASTICITY	RTA	VARIABLE	PARTIAL	TOLERANCE	F	SIGNIFICANCE
VAR17	8804.8706	20125.442	.18533875	.1119707	.1119707	VAR05	-.09862	.09848	.19044532	.667
VAR02	2.9351022	.77798578	.663	1.81214	1.81214	VAR06	.00498	.29564	.47122858E-03	.983
VAR03	-1.3814869	.92685295	.001	.51650	.51650	VAR07	-.00497	.29566	.46914515E-03	.983
VAR10	609.32488	208.23327	.152	-.94333	-.94333	VAR11	-.09852	.32551	.18624252	.671
VAR04	545.62952	972.63578	.008	.78374	.78374					
VAR08	-38.573839	50.031558	.581	1.6396070	1.6396070					
VAR09	-336.26623	475.09118	.450	-1.4381291	-1.4381291					
(CONSTANT)	-1987.2626	18066.026	.487	-1.1619760	-1.1619760					
			.914	-1.61752	-1.61752					

----- VARIABLES NOT IN THE EQUATION -----

LOCK REGRESSION

FILE LOCK123 (CREATION DATE = 05/17/78.)

***** MULTIPLE REGRESSION *****

DEPENDENT VARIABLE.. VAR01 ROATS

VARIABLE(S) ENTERED ON STEP NUMBER 1.. VAR05 QJAL

MULTIPLE R		ANALYSIS OF VARIANCE		DF	SUM OF SQUARES	MEAN SQUARE	F	SIGNIFICANCE
R SQUARE	.83443	REGRESSION	8.	195841675.94766	24480209.49338	5.44446	.001	
ADJUSTED R SQUARE	.80827	RESIDUAL	19.	85430739.01722	4496354.68512			
STD DEVIATION	.56838	COEFF OF VARIABILITY	42.7 PCT					

VARIABLES NOT IN THE EQUATION

VARIABLES IN THE EQUATION

VARIABLE	R	STD ERROR R	F	ELASTICITY	RTA	VARIABLE	PARTIAL	TOLERANCE	F	SIGNIFICANCE
VAR12	9043.8552	20548.392	.19170976	.1138461	.1138461	VAR06	.02375	.28571	.10160673E-01	.921
VAR02	3.1433083	.92650859	.665	.184252	.184252	VAR07	-.02374	.28573	.10153824E-01	.921
VAR03	-1.3514624	.94869881	2.0293231	.55314	.55314	VAR11	.44657	.00000	4.4837753	.048
VAR10	789.06756	463.49951	.171	-.92283	-.92283					
VAR04	518.40890	994.89657	.105	.7077107	.7077107					
VAR08	-30.273769	51.080583	.608	1.5578095	1.5578095					
VAR09	-314.93546	487.46537	.463	2.49628	2.49628					
VAR05	-113.55493	260.20812	.526	-1.4269417	-1.4269417					
(CONSTANT)	-2013.4446	18443.248	.667	-1.76534	-1.76534					
			.11918032E-01	-1.0882878	-1.0882878					
			.914	-1.51492	-1.51492					
				-1.758194	-1.758194					
				-.29879	-.29879					

LOCK REGRESSION

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FILE LOCK123 (CREATION DATE = 05/17/78.)

***** MULTIPLE REGRESSION *****

DEPENDENT VARIABLE.. VAR01

ROATS

VARIABLE(S) ENTERED ON STEP NUMBER 9.. VAR06 SLIPUP

MULTIPLE R .43453 ANALYSIS OF VARIANCE DF SUM OF SQUARES MEAN SQUARE F SIGNIFICANCE
W SQUARE .69644 REGRESSION 9. 195885872.84101 21765541.42678 4.58852 .003
ADJUSTED R SQUARE .54466 RESIDUAL 18. 85382542.12128 4743474.56240
STD DEVIATION 2177.95192 COEFF OF VARIABILITY 43.4 PCT

----- VARIABLES IN THE EQUATION -----

VARIABLE	H	STD ERROR B	F	ELASTICITY	ETA	VARIABLE	PARTIAL	TOLERANCE	F	SIGNIFICANCE
VAR12	8956.8845	21123.147	.17980210	.1127511	.1127511	VAR07	.00634	.00000	.68284315E-03	.979
VAR02	3.1001954	1.0433241	8.8295378	.7075922	.7075922	VAR11	.44832	.00000	4.2763340	.054
VAR03	-1.3328345	.99178939	1.8059825	-.54555	-.54555					
			.196	-.91011	-.91011					
VAR10	793.83192	477.68790	2.7560866	.7112663	.7112663					
			.114	1.02004	1.02004					
VAR04	482.94605	1080.7370	.19969041	1.4512443	1.4512443					
			.660	2.32552	2.32552					
VAR08	-36.586770	55.070185	.44138245	-1.3640462	-1.3640462					
			.515	-1.68753	-1.68753					
VAR09	-296.38162	533.44386	.30869180	-1.0241338	-1.0241338					
			.585	-1.42567	-1.42567					
VAR05	-118.57635	271.86597	.19023325	-.1839942	-.1839942					
			.668	-.31261	-.31261					
VAR06	.14768885	1.4651648	.10160673E-01	.0244897	.0244897					
			.921	.01299	.01299					
(CONSTANT)	-1056.7035	18951.651	.10659869E-01							
			.919							

F-LEVEL OR TOLERANCE-LEVEL INSUFFICIENT FOR FURTHER COMPUTATION.

LOCK REGRESSION

05/17/78. PAGE 12

FILE LOCK123 (CREATION DATE = 05/17/78.)

***** MULTIPLE REGRESSION *****

DEPENDENT VARIABLE.. VAR01 ROADS

SUMMARY TABLE

STEP	VARIABLE ENTERED	REMOVED	F TO ENTER OR REMOVE	SIGNIFICANCE	MULTIPLE R	R SQUARE	R SQUARE CHANGE	SIMPLE R	OVERALL F	SIGNIFICANCE
1	VAR12		7.71142	.010	.47828	.22875	.22875	-.47828	7.71142	.010
2	VAR02		6.50339	.017	.62287	.38796	.15921	-.43656	7.92354	.002
3	VAR03		8.26429	.008	.73806	.54473	.15677	-.44076	9.57203	.000
4	VAR10		4.32802	.049	.78539	.61683	.07210	.32075	9.25652	.000
5	VAR04		4.63880	.047	.82533	.68116	.06433	.03324	9.40015	.000
6	VAR08		.29243	.694	.82797	.68554	.00438	.04819	7.63026	.000
7	VAR09		.50097	.487	.83260	.69323	.00768	.10005	6.45637	.000
8	VAR05		.19045	.667	.83443	.69627	.00304	.36852	5.44446	.001
9	VAR06		.01016	.921	.83453	.69644	.00017	.21621	4.58852	.003

CORRELATION BETWEEN PLEASURE BOATS THROUGH
THE LOCKS AND RECREATION LOCKAGES

CORRELATION BETWEEN PLEASURE BOATS THROUGH
THE LOCKS AND RECREATION LOCKAGES

Regression analysis was utilized to test the relationship between the number of pleasure boats passing through the 28 locks and the actual number of recreation lockages. It was hypothesized that a strong correlation existed between the two variables. The regression equation had a simple R of 0.97 and explained 95 percent of the variances. The data for the two variables in the regression analysis came from Corps of Engineers records for all 28 locks and covered the years 1971 through 1977 (196 data points). This model was interfaced with the Recreation Lockage Forecasting Model in order to convert the number of pleasure boats through each lock into the number of recreation lockages.

UNITED COMPUTING SYSTEMS INC.
S P 5.5 - STATISTICAL PACKAGE FOR THE SOCIAL SCIENCES

VERSION 6.5 - - SEPT. 1, 1976

RUN NAME ROAT/LOCKAGE CORRELATION
FILE NAME NIX
VARIABLE LIST BOATS,LCKGES
INPUT MEDIUM CARD
N OF CASES 28
INPUT FORMAT FIXED (2F5.0)

ACCORDING TO YOUR INPUT FORMAT, VARIABLES ARE TO BE READ AS FOLLOWS

VARIABLE	FORMAT	RECORD	COLUMNS
BOATS	F 5.0	1	1- 5
LCKGES	F 5.0	1	6- 10

THE INPUT FORMAT PROVIDES FOR 2 VARIABLES. 2 WILL BE READ
IT PROVIDES FOR 1 RECORDS (CARDS) PER CASE. A MAXIMUM OF 10 COLUMNS ARE USED ON A RECORD.

VAR LABELS ROATS,ROATS/LCKGES,LCKAGES/
REGRESSION VARIABLES=BOATS,LCKGES/
STATISTICS REGRESSION=LCKGES WITH BOATS(2)/
READ INPUT DATA ALL

051700 CM NEEDED FOR REGRESSION

BOAT/LOCKAGE CORRELATION

05/16/78. PAGE 3

FILE NIX (CREATION DATE = 05/16/78.)

DEPENDENT VARIABLE.. LOCKGES LOCKAGES

MEAN RESPONSE 2088.71429 STD. DEV. 1132.16678

VARIABLE(S) ENTERED ON STEP NUMBER 1.: ROATS BOATS

MULTIPLE R .97427
R SQUARE .94919
ADJUSTED R SQUARE .94724
STD DEVIATION 260.05647

ANALYSIS OF VARIANCE
REGRESSION 1.
RESIDUAL 26.
COEFF OF VARIABILITY 12.5 PCT

SUM OF SQUARES
32850280.12765
1758363.58663

MEAN SQUARE
32850280.12765
67629.36872

F SIGNIFICANCE
485.73986
0

VARIABLES IN THE EQUATION

VARIABLE	B	STD ERROR B	F	SIGNIFICANCE	ELASTICITY	R ² FA	VARIABLE	PARTIAL	TOLERANCE	SIGNIFICANCE
----------	---	-------------	---	--------------	------------	-------------------	----------	---------	-----------	--------------

BOATS	.34524190	.15664684E-01	485.73986	0	.9742653					
(CONSTANT)	412.86079	90.538418	20.794164	.000	.80234					

ALL VARIABLES ARE IN THE EQUATION.

COEFFICIENTS AND CONFIDENCE INTERVALS.

VARIABLE	B	STD ERROR B	T	95.0 PCT CONFIDENCE INTERVAL
----------	---	-------------	---	------------------------------

BOATS	.34524190	.15664684E-01	22.039507	.31304268 , .37744112
CONSTANT	412.86079	90.538418	4.5600619	226.75640 , 598.96517

VARIANCE/COVARIANCE MATRIX OF THE UNNORMALIZED REGRESSION COEFFICIENTS.

BOATS .00025

BOATS

BOAT/LOCKAGE CORRELATION

05/16/78. PAGE 4

FILE MIX (CREATION DATE = 05/16/78.)

DEPENDENT VARIABLE.. LOCKGS LOCKAGES MULTIPLE REGRESSION

SUMMARY TABLE

STEP	VARIABLE ENTERED	REMOVED	F TO ENTER OR REMOVE	SIGNIFICANCE	MULTIPLE R	R SQUARE	R SQUARE CHANGE	SIMPLE R	OVERALL F	SIGNIFICANCE
1	BOATS		485.73986	0	.97427	.94919	.94919	.97427	485.73986	0

APPENDIX D

GRAVITY MODEL DOCUMENTATION

GRAVITY MODEL DOCUMENTATION

The purpose of this appendix is to give sufficient computer documentation so that programmers and the technical staff in the St. Paul District may utilize the program and update the lockage forecasts in subsequent years.

1. Overall Description of the Model: The gravity model was calibrated around the present supply of commercial marina slips in the 28 pools comprising the Upper Mississippi River. The inputs include population forecasts, growth in boat registration, distance from market areas to pools, market penetration rates, and moorage capacity of the 28 pools. The outputs from the model are essentially the potential markets for slippage on the Upper Mississippi River.

Gravity models in general are based on the concept that a specific and measurable relationship exists between the number of visitors arriving at a given destination from specific markets and a series of independent variables. The most important variables usually are: (1) the magnitude (size) of the population in the market area, and (2) the distance between the destination and market. The model typically yields high correlation between distance to populated centers and the number of visits. Correlation with other variables such as income of the population, urbanization, highway quality, and competition from other recreation areas may or may not improve the overall results of the model.

The general formula for the gravity model used in the Upper Mississippi analysis is:

$$T_{ij} = \frac{P_i \frac{A_j}{b d_{ij}}}{\frac{A}{b d_{i1}} + \frac{A_2}{b d_{i2}} + \dots + \frac{A_n}{b d_{in}}}$$

Where T_{ij} is the potential slip market from county i to pool j

P_i is the total slip market produced by county i

- A_j is the total slip market attracted by pool j
- d_{ij} is the spatial separation of county i and pool j
- b is an empirically determined exponent which expresses the average areawide effect of spatial separation between zones on the amount of slip interchange. (This factor was developed from the origin/destination data developed in the 1977 recreation lockage survey.)
- n is the number of Mississippi pools (28)

It may be noted in this equation that four factors are of major importance: trip productions, trip attractions, spatial distance separation, and the number of areas. Of course, the latter two are simply the distance between each county and the 28 Upper Mississippi pools, thus forming a matrix of 162 primary market counties by 28 pools. The trip productions (the market generated by each county) were composed of the following specific variables:

- Population forecasts for 162 counties (1980, 1985, 1990, 1995, 2000).
- Boat registration per 1,000 population in 162 counties for 1976.
- Growth in boat registration for five states in 1980, 1985, 1990, 1995, and 2000.
- Market penetration rates for 162 counties, six distance zones, and 5 years (1980, 1985, 1990, 1995, and 2000).

2. Program Flow: The model basically has two component sections. The first section is a subroutine that generates the demand for trip productions; the second portion is the gravity model allocation itself.

a. Demand: Figure D-1 shows the overall flow of the model. First, the population input for 162 counties and 5 years (1980, 1985, 1990, 1995, and 2000) is multiplied by the boat registration per 1,000 population (1976). This essentially, in terms of the present registration figures, calculates the number of total boats that will be registered for the 5 forecast years. Of course, this assumes that the 1976 per capita rate would be constant. To provide for future growth, these calculated estimates of boat registration are multiplied by state growth factors to develop the adjusted boat registration for future years. This adjusted figure is an interim model output and provides boat registration for the 162 counties and 5 forecast years.

SUBROUTINE -- DEMAND

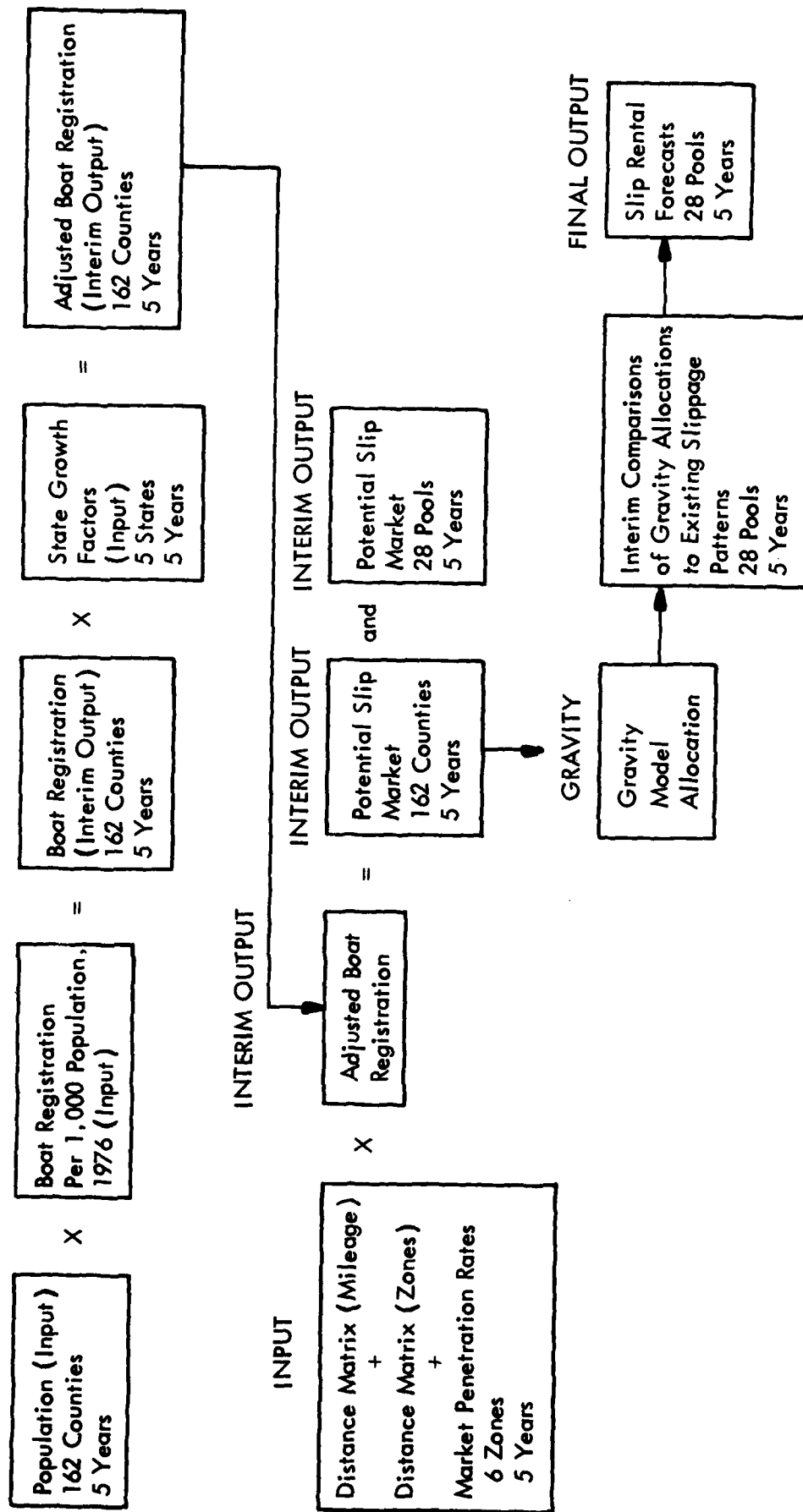


Figure D-1 - Program Flow (Gravity Model)

Next, this interim output is multiplied by a combination of the two distance matrices (both mileage and zones) and the market penetration rates to develop the gross slip market for the 162 counties and 5 years. This interim output is then input into the gravity model and allocated using the equation previously described. To provide the user the advantage of examining these numbers both at the county and the resource area level, two interim tables are generated by the model. One is the potential slip market by 162 counties and 5 years, and the second is the potential slip market for the 28 pools and 5 forecast years. The potential slip market input is the basis for the trip productions that are allocated to the attractions (28 reservoirs) using the gravity equation.

b. Allocation: The particular formation of the gravity model has been referred to by traffic planners as the "F-factor" form. The F-factor form of the gravity model is calibrated around trip productions to reproduce a trip distribution pattern similar to that provided by the interim potential slip market input. It is achieved in the following manner. Assumed values were used for the first set of F-factors, these values followed a somewhat smooth curve (assumed values were developed from the lockage survey data). As the gravity model was being calibrated, new F-factors were calculated for each model iteration by:

$$F(d)_{\text{new}} = F(d)_{\text{old}} \frac{\% \text{ of trips in } (d)_{\text{new}}}{\% \text{ of trips in } (d)_{\text{old}}}$$

where $F(d)_{\text{old}}$ is the F-factor of the previous iteration for the distance in question.

The relative size of the F-factors is of critical importance to the gravity model distribution. The distribution of F-factors is affected by several factors:

- The demand for a given length trip as indicated by the trip length frequency distribution curve.
- The potential for having a given trip length.
- The interaction caused by competition with attractions at other lengths of trips.

It is difficult to use an areawide term to describe what will happen for individual counties in any model. The influence of one large trip interchange at a particular distance will affect all other trip interchanges at the same distance. The interaction caused by large trip interchanges will affect those of other distances also.

The calibration criteria center around two factors. One is the ratio of actual trip length to computed trip length by the model, and the second is the standard deviation of the ratios of percent of trips distributed to each distance band compared to the desired distribution. The model will continue to reiterate as presently programmed until the trip length ratio reaches a level of 1.7 and the standard deviation is reduced to 1.00.^{1/} At that time, the model prints a matrix that displays a number of potential slips being sought at each pool for all 162 counties.

This process is repeated and reiterated until the criteria have been reached for all 5 forecast years. At the conclusion of the program, a final table is printed that shows the potential slip market demand for each of the 28 Mississippi pools for the 5 forecast years. Some of the basic inputs and outputs are described below:

3. Data Input Cards

a. Population Forecasts

<u>Column</u>	<u>Contents</u>
1-12	County name
13-15	County number
19-20	State number
21-30	1980 population
31-40	1985 population
41-50	1990 population
51-60	1995 population
61-70	2000 population

b. Present Boat Registration Per 1,000 Population (1976)

<u>Column</u>	<u>Contents</u>
1-3	County number
4-5	State name
7-10	Boat registration/1,000 population

^{1/} These constraints were empirically developed for the particular data used in the Upper Mississippi River model. Normally the gravity model converges if the ratios are within 0.05 standard deviation. Because of the problem of using an areawide F-factor term to describe trip distribution patterns over a 400-mile stretch of river, however, quick convergence with this lower limit could not be achieved.

c. Boat Registration Growth Factors

<u>Column</u>	<u>Contents</u>
1-2	State number
7-10	1980 growth factor
17-20	1985 growth factor
27-30	1990 growth factor
37-40	1995 growth factor
47-50	2000 growth factor
61-80	State name

d. Distance Matrix (Mileage)

<u>Column</u>	<u>Contents</u>
1-3	County number
5-6	State number
11-15	Distance from county to Lock 51
16-20, etc.	Continuing in Fields of 5.0 through Column 80 and from Column 11 through 80 or Card 2 for all other locks

e. Distance Matrix (Zones)

<u>Column</u>	<u>Contents</u>
1-3	County number
5-6	Column number
10-37	Zone each lock falls in, in terms of distance from county ^{1/}

<u>1/ Zone Number</u>	<u>Mileage</u>
1	0-25
2	26-50
3	51-75
4	76-99
5	100-150
6	150+

f. Market Penetration Rates

<u>Column</u>	<u>Contents</u>
1-4	Year
6-10	Distance Band 1 (Percent of Market)
16-20	Distance Band 2 (Percent of Market)
26-30	Distance Band 3 (Percent of Market)
36-40	Distance Band 4 (Percent of Market)
46-50	Distance Band 5 (Percent of Market)
56-60	Distance Band 6 (Percent of Market)

g. Moorage Capacity of Pools

<u>Column</u>	<u>Contents</u>
1-2	Pool number
7-10	Quality (distribution of commercial slips, 1977--percent)
70	Must be "3"

h. Friction Factors

<u>Column</u>	<u>Contents</u>
1-2	Distance (rounded to 10 miles) in sequence from 1 to 75
3-6	Friction factors
70	Must be "5"

i. Trip Length Frequency Factors

<u>Column</u>	<u>Contents</u>
1-2	Distance (rounded to 10 miles) in sequence from 1-75
3-6	Percentage (same as friction factors)
70	Must be "6"

4. Gravity Model Outputs: A number of interim outputs provided by the program give the user a cross-check on both data inputs and subsequent final output. These are described below:

a. Total Boat Registration: The resulting estimates of multiplying the 1976 per capita boat registration times population forecasts provide this interim output.

b. Adjusted Boat Registration: Applying the boat registration growth factors to the total boat registration provides this matrix. It is a matrix of 162 counties by the 5 forecast years.

c. Potential Slip Market: This interim output is provided in two forms. One is a matrix of 162 counties by 5 forecast years, and the second is a matrix of 28 pools by 5 forecast years. It is the resulting interim output from multiplying penetration rates times the adjusted boat registration. The first table is the basic trip productions input that is allocated in the gravity model.

d. Comparison Tables: Two basic comparison tables are provided as the model begins to reiterate the allocation process. The first table is a matrix of 28 reservoirs by the trips desired (slips) and the computed trips (slips) based on present moorage capacity. The computed trips are the model allocations. A third column provides a ratio between the two, and the fourth column provides a difference between computed and desired trips. At the end of three reiterations, a second table is output. For each distance zone, the final F-factor for the reiteration of the three tables is produced. A second column provides the trip length frequency factors; the third column produces the model trip length frequency results; the fourth column shows the ratio of the F-factors to the trip length frequency factors.

At the conclusion of this second table, the average trip length, the computed trip length, the ratio, between the two and the mean and standard deviation are produced. If the convergence criteria are not reached, the model goes through another set of reiterations. This process continues until the criteria are reached. At that time, yet another output is produced. It shows the number of trip productions, potential slip market generated for each separate pool by each county. The results of the final model allocation of potential slip market for each pool is then stored for the final output. The above process is repeated for each of the 5 forecast years and the final table outputs potential slip market for each of the 28 pools for the 5 forecast years. A few of the output tables for the runs on the Upper Mississippi River are shown in the next section.

5. Data for Upper Mississippi Gravity Analysis: The following pages contain the input data and interim and final outputs for the gravity analysis on the Upper Mississippi River (28 pools).

a. Input Data

- Population forecasts
- Distance matrix (mileage)
- Moorage capacity of pools
- Friction factors
- Trip length frequency factors

b. Interim Outputs

- Boat registration
- Adjusted boat registration
- Potential slip market (counties)
- Potential slip market (pools)

c. Final Output

- Potential slip market (28 pools and 5 years)

INPUT DATA

POPULATION DATA IN THOUSANDS OF PERSONS

1	ADAMS	17	67.1	66.9	69.2	72.9	81.5
2	HOND	17	15.6	15.7	15.9	16.5	16.8
3	HOONE	17	26.1	28.4	31.6	34.7	38.0
4	BROWN	17	5.1	5.0	4.8	4.4	5.2
5	BUREAU	17	37.4	38.2	39.7	41.5	43.0
6	CALHOUN	17	5.4	5.4	5.3	5.3	5.3
7	CARROLL	17	19.4	19.7	20.1	20.9	22.0
8	CASS	17	13.5	13.4	14.4	14.8	15.6
9	CHRISTIAN	17	36.5	37.0	37.8	38.3	39.9
10	CLINTON	17	30.2	30.6	31.3	31.6	31.9
11	DE KALB	17	69.1	75.5	83.6	93.6	106.6
12	FAYETTE	17	20.5	21.5	22.7	23.3	23.4
13	FULTON	17	42.5	42.9	44.4	47.5	51.7
14	GRENE	17	16.2	16.0	16.1	16.0	16.0
15	HANCOCK	17	21.3	21.3	21.4	22.2	24.4
16	HENDERSON	17	8.7	8.9	9.0	9.5	10.4
17	HENRY	17	57.0	59.3	61.0	63.8	68.2
18	JEFFERSON	17	33.9	34.5	35.9	37.1	39.4
19	JERSEY	17	19.9	20.2	20.8	21.9	23.0
20	JO DAVIESS	17	21.5	22.3	23.2	24.0	25.1
21	KNOX	17	63.3	65.2	66.8	70.6	76.4
22	LA SALLE	17	107.5	110.8	116.0	121.8	126.4
23	LEE	17	34.6	38.0	41.4	45.1	49.1
24	MC DONOUGH	17	40.3	45.3	48.5	52.0	60.4
25	MACOUPIN	17	46.0	47.7	50.3	52.1	55.2
26	MADISON	17	251.3	250.3	265.3	285.7	293.1
27	MARION	17	39.4	42.1	43.8	45.2	45.6
28	MAPSHALL	17	13.1	13.3	13.5	13.7	13.7
29	MASON	17	17.0	16.8	17.7	20.0	22.9
30	MENARD	17	10.7	11.0	11.6	12.0	12.8
31	MEHNER	17	18.3	19.1	19.9	21.3	23.4
32	MONROE	17	20.9	21.3	21.4	23.9	25.2
33	MONTGOMERY	17	30.7	31.1	31.9	32.4	33.9
34	MORGAN	17	34.4	35.6	37.6	39.0	41.6
35	OGLE	17	43.4	45.4	47.7	50.7	54.2
36	PEORIA	17	204.8	212.0	219.4	227.2	237.5
37	PERRY	17	19.6	19.5	20.1	20.4	20.9
38	PIKE	17	18.3	18.0	18.1	18.5	20.2
39	PUTNAM	17	6.0	6.0	6.6	7.2	7.6
40	RANDOLPH	17	32.9	33.6	34.9	36.6	38.4
41	ROCK ISLAND	17	169.6	176.4	183.4	192.3	206.3
42	ST CLAIR	17	286.2	286.6	301.2	310.4	328.9
43	SANGAMON	17	170.1	178.9	192.4	201.9	217.2
44	SCHUYLER	17	7.3	7.2	7.2	7.4	8.1
45	SCOTT	17	5.6	5.6	5.5	5.4	5.6
46	STARK	17	7.3	7.5	7.6	7.3	7.4
47	STEPHENSON	17	48.2	47.9	49.8	52.0	54.5
48	WARREN	17	22.7	23.4	23.8	25.0	26.4
49	WASHINGTON	17	15.1	15.3	15.6	15.7	16.0
50	WHITESIDE	17	66.5	69.8	73.0	78.2	85.8
51	WINNEBAGO	17	243.1	260.0	278.6	298.5	321.1
52	ALLAMAKEE	19	15.7	16.3	16.8	17.2	17.6
53	MONTON	19	23.2	23.6	24.0	24.3	24.4
54	BLACK HAWK	19	138.6	142.0	145.1	147.7	150.0
55	BREMER	19	26.0	27.3	28.3	28.8	29.0
56	BUCHANAN	19	22.9	23.9	25.0	26.0	26.0
57	CEDAR	19	16.6	16.3	16.2	16.0	15.4
58	CHICKASAW	19	15.5	16.1	16.8	17.5	18.1

59	CLAYTON	19	21.5	22.3	23.0	23.7	24.2
60	CLINTON	19	59.9	62.1	64.3	66.2	67.7
61	DAVIS	19	8.8	9.2	9.5	9.7	9.8
62	DELAWARE	19	19.5	20.3	21.4	22.3	23.2
63	DES MOINES	19	45.0	44.8	44.8	44.9	45.2
64	DURUQUE	19	98.3	103.1	108.3	113.2	117.5
65	FAYETTE	19	27.2	27.8	28.3	28.7	29.1
66	HENRY	19	17.3	17.1	17.1	17.2	17.3
67	HOWARD	19	11.7	12.1	12.5	12.8	13.0
68	IOWA	19	15.5	15.7	16.0	16.2	16.4
69	JACKSON	19	21.9	22.7	23.6	24.5	25.3
70	JEFFERSON	19	13.1	12.3	11.7	11.3	11.1
71	JOHNSON	19	80.7	84.7	88.6	92.1	95.2
72	JONES	19	20.3	20.8	21.3	21.4	22.3
73	KEOKUK	19	13.6	13.7	13.7	13.7	13.8
74	LEE	19	39.9	39.2	39.0	39.1	39.4
75	LINN	19	167.7	170.4	174.0	177.8	181.2
76	LOUISA	19	11.0	11.2	11.4	11.5	11.6
77	MUSCATINE	19	41.2	43.5	45.7	47.5	48.8
78	SCOTT	19	156.9	164.8	172.9	180.1	186.0
79	VAN BUREN	19	7.7	7.6	7.3	7.1	7.0
80	WAPELLO	19	37.9	36.6	35.7	35.1	34.8
81	WASHINGTON	19	16.4	15.8	15.4	15.2	15.1
82	WINNEBIEG	19	21.0	20.9	20.9	20.9	21.0
83	ANOKA	27	200.3	225.0	255.5	283.0	305.9
84	HENTON	27	23.4	25.2	27.0	28.6	29.7
85	CARVER	27	36.4	36.5	36.3	36.8	36.9
86	CHISAGO	27	23.9	28.5	34.0	38.4	44.9
87	DAKOTA	27	181.1	204.3	234.6	264.8	293.3
88	DODGE	27	13.2	13.6	13.6	13.6	13.6
89	FILLMORE	27	21.1	20.9	20.7	20.2	19.5
90	GOODHUE	27	38.4	41.1	43.6	46.3	48.4
91	HENNEPIN	27	903.4	1005.2	1018.1	1019.2	1011.1
92	HOUSTON	27	18.2	18.4	18.8	19.1	19.2
93	ISANTI	27	21.7	25.3	29.0	33.0	37.0
94	LE SUEUR	27	22.9	23.8	24.6	24.9	25.1
95	MC LEOD	27	31.4	34.1	36.8	39.5	42.3
96	MEERER	27	19.7	20.5	20.9	21.4	21.4
97	MOWER	27	44.1	44.9	45.0	44.5	43.1
98	OLMSTED	27	97.8	105.9	114.1	121.5	127.4
99	WAMSEY	27	485.7	494.1	498.0	495.0	487.2
100	WICE	27	44.7	46.4	47.6	49.0	50.2
101	SCOTT	27	39.1	43.0	47.8	52.5	56.3
102	SHERBURNE	27	25.5	29.6	34.1	38.4	45.3
103	STEELE	27	16.1	16.3	16.4	16.5	16.3
104	STEELE	27	29.0	30.3	31.2	31.8	31.9
105	WARASHA	27	18.3	18.7	18.8	19.0	19.0
106	WASHINGTON	27	103.7	113.4	128.1	142.1	154.4
107	WINONA	27	46.8	48.1	48.9	49.6	50.1
108	WRIGHT	27	51.2	59.6	69.5	76.3	87.0
109	ADAMS	29	26.1	28.0	30.0	32.2	34.4
110	AUDRAIN	29	25.9	26.2	26.5	26.8	27.1
111	BOONE	29	94.5	98.2	101.9	105.9	109.9
112	GALLAWAY	29	28.4	29.9	31.4	33.0	34.7
113	CLARK	29	7.8	7.6	7.4	7.2	7.1
114	FRANKLIN	29	70.3	80.8	91.2	104.8	118.1
115	CASCONADE	29	13.8	14.0	13.7	13.9	14.1
116	JEFFERSON	29	134.9	156.9	178.9	208.1	237.3
117	KNOX	29	5.2	5.0	4.8	4.6	4.4
118	LEWIS	29	10.4	10.0	9.7	9.4	9.1
119	LINCOLN	29	21.5	24.0	26.4	29.4	32.4
120	MACON	29	14.2	14.8	17.4	18.0	18.7
121	MARION	29	27.7	27.6	27.5	27.4	27.3
122	MONROE	29	10.5	11.2	12.0	12.8	13.7
123	MONTGOMERY	29	11.8	12.4	12.9	13.5	14.1

124	PIKE	24	17.2	17.4	17.7	18.0	18.2
125	HALLS	24	9.2	10.2	11.2	12.4	13.6
126	HANDOLPH	24	25.6	27.7	29.8	32.2	34.7
127	ST CHARLES	29	133.4	165.4	197.3	244.6	291.8
128	ST FRANCOI	24	40.4	42.8	45.1	47.7	50.3
129	ST LOUIS	24	971.7	993.8	1015.9	1039.0	1062.1
130	STE GENEVI	24	14.3	15.2	16.2	17.3	18.4
131	SCHUYLER	24	5.3	5.8	6.2	6.8	7.3
132	SCOTLAND	24	5.5	5.5	5.5	5.5	5.5
133	SHELBY	24	7.6	7.6	7.5	7.4	7.4
134	WARREN	24	14.5	18.4	22.4	28.5	34.4
135	WASHINGTON	24	17.2	18.6	20.0	21.6	23.3
136	ST LOUIS C	24	454.5	460.0	466.4	473.3	480.2
137	ADAMS	55	12.7	14.9	17.3	19.9	22.5
138	BARRON	55	39.1	42.5	45.8	48.7	51.0
139	BUFFALO	55	14.6	15.3	15.9	16.4	16.8
140	CHIPPEWA	55	50.8	53.2	55.7	57.6	59.1
141	CLARK	55	31.7	33.0	34.4	35.5	36.0
142	CRANFORD	55	15.4	16.3	16.8	17.2	17.2
143	DUNN	55	31.2	32.3	33.3	34.2	35.2
144	EAU CLAIRE	55	73.9	77.5	80.8	83.8	86.6
145	GRANT	55	53.2	56.0	58.8	61.3	63.4
146	GREEN	55	30.9	33.7	36.5	39.1	41.3
147	IOWA	55	19.7	20.4	21.2	21.8	22.0
148	JACKSON	55	16.3	17.0	17.7	18.1	18.3
149	JUNEAU	55	20.1	21.2	22.5	23.5	24.3
150	LA CROSSE	55	85.8	88.9	91.6	93.8	95.6
151	LAFAYETTE	55	18.7	19.7	20.9	21.9	22.4
152	MONROE	55	34.5	36.7	38.8	40.4	41.5
153	PEPIN	55	7.4	7.6	7.9	8.0	8.1
154	PIENCE	55	32.4	35.0	37.4	39.2	40.7
155	POLK	55	33.2	37.3	41.8	46.0	50.1
156	RICHLAND	55	16.0	15.8	15.6	15.2	14.7
157	ROCK	55	145.4	150.0	154.6	159.3	164.2
158	ST CROIX	55	43.6	49.9	57.0	64.1	70.8
159	SAUK	55	41.8	43.8	45.8	47.2	48.3
160	TREMPEALEA	55	24.7	25.8	26.8	27.7	28.3
161	VERNON	55	25.6	26.6	27.5	28.1	28.3
162	WOOD	55	70.0	73.5	77.0	79.9	81.5

1	431	421	417	414	420	393	381	366	357	339	328	317	275	234	210	193	165	144	130	114	94	54	35	24	20	49	100
2	548	550	535	515	540	515	504	484	472	454	443	431	419	407	395	383	371	359	347	335	323	311	300	288	276	264	252
3	344	333	327	318	287	240	212	183	163	151	139	127	115	103	91	79	67	55	43	31	19	7	1	1	1	1	1
4	437	428	422	422	394	384	371	360	349	338	327	316	305	294	283	272	261	250	239	228	217	206	195	184	173	162	151
5	364	359	355	349	343	316	293	279	262	242	220	212	180	136	105	73	54	44	34	24	14	4	1	1	1	1	1
6	516	503	489	460	436	411	394	378	361	345	329	313	297	281	265	249	233	217	201	185	169	153	137	121	105	89	73
7	314	301	300	290	285	255	232	217	197	181	165	149	133	117	101	85	69	53	37	21	5	1	1	1	1	1	1
8	450	440	434	434	410	394	381	367	354	340	326	312	298	284	270	256	242	228	214	199	185	171	157	143	129	115	101
9	513	503	490	480	451	424	404	385	361	342	324	306	288	270	252	234	216	198	180	162	144	126	108	90	72	54	36
10	614	606	590	562	563	534	511	487	460	436	411	387	362	337	312	287	262	237	212	187	162	137	112	87	62	37	12
11	398	392	387	370	360	314	286	272	254	242	224	212	194	176	158	140	122	104	86	68	50	32	14	6	1	1	1
12	512	504	497	485	463	437	411	385	358	333	311	289	266	243	220	197	174	151	128	105	82	59	36	13	6	1	1
13	440	432	424	411	389	363	334	324	311	300	288	274	261	248	235	222	209	196	183	170	157	144	131	118	105	92	79
14	521	523	516	502	482	457	434	423	409	389	369	353	329	304	280	255	230	205	180	155	130	105	80	55	30	5	1
15	426	419	412	399	374	356	334	322	310	302	282	264	243	224	204	184	164	144	124	104	84	64	44	24	4	1	1
16	387	380	373	370	348	324	301	280	276	260	247	229	217	200	187	169	150	132	114	96	78	60	42	24	6	1	1
17	377	369	363	347	324	294	264	241	230	210	184	157	131	105	79	53	27	1	1	1	1	1	1	1	1	1	1
18	558	542	536	522	500	474	448	424	404	384	364	344	324	304	284	264	244	224	204	184	164	144	124	104	84	64	44
19	352	342	338	326	298	274	254	234	214	194	174	154	134	114	94	74	54	34	14	1	1	1	1	1	1	1	1
20	487	480	472	463	443	417	391	365	339	313	287	261	235	209	183	157	131	105	79	53	27	1	1	1	1	1	1
21	494	486	478	469	449	423	397	371	345	319	293	267	241	215	189	163	137	111	85	59	33	7	1	1	1	1	1
22	362	354	348	339	320	294	274	254	234	214	194	174	154	134	114	94	74	54	34	14	1	1	1	1	1	1	1
23	426	416	410	401	382	356	330	304	278	252	226	200	174	148	122	96	70	44	18	1	1	1	1	1	1	1	1
24	536	530	516	495	469	443	417	391	365	339	313	287	261	235	209	183	157	131	105	79	53	27	1	1	1	1	1
25	426	416	410	401	382	356	330	304	278	252	226	200	174	148	122	96	70	44	18	1	1	1	1	1	1	1	1
26	536	530	516	495	469	443	417	391	365	339	313	287	261	235	209	183	157	131	105	79	53	27	1	1	1	1	1
27	426	416	410	401	382	356	330	304	278	252	226	200	174	148	122	96	70	44	18	1	1	1	1	1	1	1	1
28	536	530	516	495	469	443	417	391	365	339	313	287	261	235	209	183	157	131	105	79	53	27	1	1	1	1	1
29	426	416	410	401	382	356	330	304	278	252	226	200	174	148	122	96	70	44	18	1	1	1	1	1	1	1	1
30	536	530	516	495	469	443	417	391	365	339	313	287	261	235	209	183	157	131	105	79	53	27	1	1	1	1	1
31	426	416	410	401	382	356	330	304	278	252	226	200	174	148	122	96	70	44	18	1	1	1	1	1	1	1	1
32	536	530	516	495	469	443	417	391	365	339	313	287	261	235	209	183	157	131	105	79	53	27	1	1	1	1	1
33	426	416	410	401	382	356	330	304	278	252	226	200	174	148	122	96	70	44	18	1	1	1	1	1	1	1	1
34	536	530	516	495	469	443	417	391	365	339	313	287	261	235	209	183	157	131	105	79	53	27	1	1	1	1	1
35	426	416	410	401	382	356	330	304	278	252	226	200	174	148	122	96	70	44	18	1	1	1	1	1	1	1	1
36	536	530	516	495	469	443	417	391	365	339	313	287	261	235	209	183	157	131	105	79	53	27	1	1	1	1	1
37	426	416	410	401	382	356	330	304	278	252	226	200	174	148	122	96	70	44	18	1	1	1	1	1	1	1	1
38	536	530	516	495	469	443	417	391	365	339	313	287	261	235	209	183	157	131	105	79	53	27	1	1	1	1	1
39	426	416	410	401	382	356	330	304	278	252	226	200	174	148	122	96	70	44	18	1	1	1	1	1	1	1	1
40	536	530	516	495	469	443	417	391	365	339	313	287	261	235	209	183	157	131	105	79	53	27	1	1	1	1	1
41	426	416	410	401	382	356	330	304	278	252	226	200	174	148	122	96	70	44	18	1	1	1	1	1	1	1	1
42	536	530	516	495	469	443	417	391	365	339	313	287	261	235	209	183	157	131	105	79	53	27	1	1	1	1	1
43	426	416	410	401	382	356	330	304	278	252	226	200	174	148	122	96	70	44	18	1	1	1	1	1	1	1	1
44	536	530	516	495	469	443	417	391	365	339	313	287	261	235	209	183	157	131	105	79	53	27	1	1	1	1	1
45	426	416	410	401	382	356	330	304	278	252	226	200	174	148	122	96	70	44	18	1	1	1	1	1	1	1	1

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AVERAGE TRIP LENGTH (ATI) = 49.01

INTERIM OUTPUTS

PER THOUSAND CAPITA BOAT REGISTRATIONS

1	ADAMS	17	2751.1	2742.9	2837.2	2988.9	3341.1
2	HOND	17	528.8	532.2	539.0	550.3	560.5
3	HONNE	17	584.6	644.1	707.8	777.1	851.2
4	BROWN	17	114.2	112.0	107.5	107.5	116.5
5	RUNFAU	17	1208.0	1233.9	1282.3	1340.4	1488.9
6	CALHOUN	17	519.5	519.5	509.9	509.9	509.9
7	CARROLL	17	1160.1	1178.1	1202.0	1249.8	1315.6
8	CASS	17	742.5	764.5	792.0	814.0	858.0
9	CHRISTIAN	17	1693.6	1716.8	1753.9	1777.1	1851.4
10	CLINTON	17	1214.0	1230.1	1258.3	1270.3	1282.4
11	DE KALB	17	1050.3	1147.6	1270.7	1422.7	1620.3
12	FAYETTE	17	820.0	860.0	908.0	932.0	936.0
13	FULTON	17	2460.7	2483.9	2570.8	2750.2	2993.4
14	GREENE	17	523.3	516.8	520.0	516.8	516.8
15	HANCOCK	17	815.8	815.8	819.6	850.3	934.5
16	HENDERSON	17	605.5	619.4	626.4	661.2	723.8
17	HENRY	17	2171.7	2259.3	2324.1	2430.8	2598.4
18	JEFFERSON	17	1674.7	1704.3	1773.5	1832.7	1946.4
19	JERSEY	17	851.7	864.6	890.2	937.3	984.4
20	JO DAVIESS	17	1206.1	1251.0	1301.5	1346.4	1408.1
21	KNOX	17	2253.5	2321.1	2378.1	2513.4	2719.8
22	LA SALLE	17	3268.0	3368.3	3526.4	3702.7	3842.6
23	LEE	17	1231.8	1352.8	1473.8	1605.5	1748.0
24	MC DONOUGH	17	951.1	1069.1	1144.6	1227.2	1425.4
25	MACOUPIN	17	1646.8	1707.7	1800.7	1865.2	1976.2
26	MADISON	17	8896.0	8860.6	9391.6	10113.8	10375.7
27	MARION	17	1773.0	1894.5	1971.0	2034.0	2052.0
28	MARSHALL	17	467.7	474.8	481.9	489.1	489.1
29	MASON	17	1130.5	1117.2	1177.1	1330.0	1522.8
30	MENARD	17	542.5	557.7	588.1	608.4	649.0
31	MERCER	17	953.4	995.1	1036.8	1109.7	1219.1
32	MONROE	17	840.2	856.3	880.3	960.8	1013.0
33	MONTGOMERY	17	1172.7	1188.0	1218.6	1237.7	1295.0
34	MORGAN	17	1056.1	1092.9	1154.3	1197.3	1277.1
35	OGLE	17	1393.1	1457.3	1531.2	1627.5	1739.8
36	PEORIA	17	6717.4	6953.6	7196.3	7452.2	7790.0
37	PERRY	17	1140.7	1134.9	1169.8	1187.3	1216.4
38	PIKE	17	775.9	763.2	767.4	784.4	856.5
39	PUTNAM	17	273.6	273.6	301.0	324.3	346.6
40	RANDOLPH	17	1645.0	1680.0	1745.0	1830.0	1920.0
41	ROCK ISLAND	17	7140.2	7426.4	7721.1	8095.8	8685.2
42	ST CLAIR	17	8385.7	8397.4	8825.2	9094.7	9636.8
43	SANGAMON	17	6361.7	6690.9	7195.8	7551.1	8123.3
44	SCHUYLER	17	435.1	429.1	429.1	441.0	482.0
45	SCOTT	17	197.1	193.6	193.6	190.1	197.1
46	STARK	17	193.4	198.7	201.4	193.4	196.1
47	STEPHENSON	17	1720.7	1710.0	1777.9	1956.4	1945.7
48	WARREN	17	744.5	819.0	833.0	875.0	921.5
49	WASHINGTON	17	543.6	550.8	561.6	565.2	576.0
50	WHITESIDE	17	3338.3	3504.0	3664.6	3925.6	4307.2
51	WINNEBAGO	17	7098.5	7592.0	8135.1	8716.2	9376.1
52	ALLAMAKEE	19	1309.4	1359.4	1401.1	1436.5	1467.2
53	RENTON	19	1234.2	1255.5	1276.3	1292.8	1298.1
54	BLACK HAWK	19	7541.4	7767.4	7937.0	8379.2	8805.0
55	BREMEN	19	1427.4	1498.8	1553.7	1681.1	1792.1
56	BUCHANAN	19	1257.2	1312.1	1372.5	1427.9	1476.0
57	CEDAR	19	869.8	854.1	848.4	834.9	827.9
58	CHICKASAW	19	708.3	735.8	767.8	799.7	827.2

59	CLAYTON	19	1812.4	1479.9	1938.9	1997.9	2047.1
60	CLINTON	19	4612.3	4741.7	4951.1	5097.4	5212.9
61	DAVIS	19	310.6	324.8	335.3	342.4	345.9
62	DELAWARE	19	840.4	874.9	922.3	961.1	999.9
63	DES MOINES	19	3447.0	3431.7	3431.7	3439.3	3462.3
64	DUBUQUE	19	4531.6	4752.9	4992.6	5218.5	5416.7
65	FAYETTE	19	1313.8	1342.7	1364.9	1386.2	1405.5
66	HENRY	19	839.0	829.3	829.3	834.2	839.0
67	HOWARD	19	400.1	413.8	427.9	437.8	444.5
68	IOWA	19	678.9	687.7	700.8	709.6	718.3
69	JACKSON	19	1780.5	1845.5	1914.7	1991.8	2056.9
70	JEFFERSON	19	610.5	673.2	745.2	826.6	917.3
71	JOHNSON	19	3623.4	3803.0	3978.1	4135.3	4274.5
72	JONES	19	1013.0	1037.9	1062.9	1087.4	1112.4
73	KEOKUK	19	505.9	509.6	509.6	509.6	513.4
74	LEE	19	2306.2	2265.8	2254.2	2260.0	2277.3
75	LINN	19	10363.9	10530.7	10753.2	10988.0	11194.2
76	LOUISA	19	1956.0	1979.2	1994.4	1994.0	1994.0
77	MUSCATINE	19	2921.1	3084.1	3240.1	3367.7	3459.9
78	SCOTT	19	8017.6	8421.3	8835.2	9203.1	9504.6
79	VAN BUREN	19	429.7	412.9	407.3	395.2	390.4
80	WAPELLO	19	2044.5	2013.0	1963.5	1930.5	1914.0
81	WASHINGTON	19	895.4	862.7	840.8	829.9	824.5
82	WINNEBAGO	19	1956.3	1951.3	1951.3	1951.3	1956.3
83	ANOKA	27	6549.8	7380.0	8380.4	9282.4	10033.5
84	BENTON	27	1633.3	1759.0	1884.4	1996.3	2173.1
85	CARVER	27	3075.4	3243.1	3402.8	3513.7	3592.9
86	CHISAGO	27	2385.2	2844.3	3393.2	3832.3	4481.0
87	DAKOTA	27	15628.9	17631.1	20246.0	22452.2	25311.4
88	DODGE	27	433.6	443.2	452.8	452.8	443.2
89	FILLMORE	27	797.6	790.0	782.5	763.6	737.1
90	GOODHUE	27	3098.9	3316.8	3518.5	3736.4	3922.0
91	HENNEPIN	27	10522.4	10755.6	10893.7	10905.4	10918.8
92	HOUSTON	27	1172.1	1185.0	1210.7	1230.0	1236.5
93	ISANTI	27	91.1	106.3	121.8	139.6	155.4
94	LE SUEUR	27	507.7	421.2	336.8	249.9	165.1
95	MC LEOD	27	216.7	235.3	253.9	272.5	291.9
96	MEeker	27	236.4	246.0	250.4	256.8	256.4
97	MOWER	27	2500.5	2545.8	2551.5	2523.1	2443.4
98	OLMSTED	27	6112.5	6618.7	7131.2	7593.8	7962.5
99	RAMSEY	27	46141.5	46939.5	47310.0	47025.0	46284.0
100	RICE	27	3540.2	3674.9	3749.9	3800.0	3874.8
101	SCOTT	27	3804.4	4183.9	4650.9	5108.2	5524.6
102	SHEPHERD	27	392.7	455.8	523.6	606.4	697.6
103	STOLEY	27	998.2	1010.6	1010.6	1023.0	1010.4
104	STEELE	27	1870.5	1954.3	2012.4	2051.1	2157.5
105	WABASHA	27	53.1	54.2	54.5	55.1	55.1
106	WASHINGTON	27	974.8	1006.0	1004.1	1035.7	1051.4
107	WINONA	27	3492.5	3795.1	3858.2	3913.4	3952.9
108	WRIGHT	27	2150.4	2503.2	2919.0	3204.6	3654.0
109	ADAIR	29	482.9	510.0	555.0	595.7	638.2
110	AUDRAIN	29	1059.3	1071.6	1083.4	1096.1	1108.4
111	BOONE	29	2655.4	2759.4	2863.4	2975.8	3088.2
112	CALLAWAY	29	1400.2	1461.4	1514.7	1571.5	1631.0
113	CLARK	29	274.6	267.5	260.5	253.4	246.4
114	FRANKLIN	29	3276.0	3765.3	4249.9	4883.7	5512.4
115	GASCONADE	29	756.2	811.8	872.9	939.6	1006.4
116	JEFFERSON	29	5935.6	6903.6	7871.6	9156.4	10441.2
117	KNOX	29	79.6	76.5	73.4	70.4	67.3
118	LEWIS	29	274.6	264.8	254.1	248.2	247.4
119	LINCOLN	29	460.0	460.0	1056.0	1176.0	1296.0
120	MACON	29	555.7	576.2	596.4	617.4	641.4
121	MARION	29	1144.4	1139.9	1135.7	1131.6	1127.5
122	MONROE	29	186.9	199.4	213.6	227.8	243.9
123	MONTGOMERY	29	273.8	287.7	299.3	313.2	327.1
124	PIKE	29	708.1	667.4	621.3	595.2	564.5

125	HALLS	29	198.7	220.3	241.9	267.8	293.8
126	RANDOLPH	29	983.0	1063.7	1144.3	1235.5	1332.5
127	ST CHARLES	29	6469.9	8021.9	9569.0	11863.1	14152.3
128	ST FRANCOI	29	1607.9	1703.4	1795.0	1898.5	2001.9
129	ST LOUIS	29	30317.0	31006.6	31696.1	32416.8	33137.5
130	STE GENEVI	29	499.1	530.5	565.4	603.8	642.2
131	SCHUYLER	29	97.5	106.7	114.1	125.1	134.3
132	SCOTLAND	29	79.2	79.2	79.2	79.2	79.2
133	SHELBY	29	165.7	165.7	163.5	161.3	161.3
134	WARREN	29	403.1	511.5	622.7	742.3	861.9
135	WASHINGTON	29	276.9	299.5	322.0	347.8	375.1
136	ST LOUIS C	29	5789.7	5940.0	6099.0	6253.4	6417.7
137	ADAMS	55	243.8	286.1	332.2	382.1	432.0
138	BARRON	55	2048.8	2227.0	2399.9	2551.9	2672.4
139	BUFFALO	55	1327.1	1390.2	1455.3	1520.8	1587.1
140	CHIPPEWA	55	563.9	590.5	618.3	639.4	656.0
141	CLARK	55	2028.8	2112.0	2201.6	2272.0	2304.0
142	CRAWFORD	55	1559.5	1609.8	1658.2	1697.6	1697.6
143	DUNN	55	2199.6	2277.1	2347.6	2411.1	2481.6
144	EAU CLAIRE	55	7094.4	7440.0	7756.8	8044.8	8313.6
145	GRANT	55	3489.9	3673.6	3857.3	4021.3	4159.8
146	GREEN	55	1279.3	1395.2	1511.1	1618.7	1709.8
147	IOWA	55	813.6	942.5	1075.6	1200.3	1308.6
148	JACKSON	55	780.9	914.3	1047.4	1177.0	1296.6
149	JUNEAU	55	1766.8	1863.5	1977.7	2065.6	2138.0
150	LA CROSSE	55	7619.0	7894.3	8134.1	8329.4	8489.3
151	LAFAYETTE	55	637.7	671.8	712.7	749.8	783.8
152	MONROE	55	1397.2	1486.3	1571.4	1636.2	1680.7
153	PEPIN	55	616.4	633.1	658.1	686.4	714.7
154	PIERCE	55	1999.1	2088.9	2131.0	2165.4	2200.1
155	POLK	55	999.3	1122.7	1259.2	1384.6	1508.0
156	RICHLAND	55	828.8	818.4	808.1	787.4	761.5
157	ROCK	55	8418.7	8462.9	9530.3	10034.1	10433.4
158	ST CROIX	55	3488.0	3992.0	4560.0	5128.0	5664.0
159	SAUK	55	3155.9	3306.9	3457.9	3563.6	3646.6
160	TREMPEALEA	55	1464.7	1529.9	1599.2	1642.6	1678.2
161	VERNON	55	1449.0	1505.6	1556.5	1590.5	1601.2
162	WOOD	55	6363.0	6681.1	6999.3	7242.9	7408.4

APPLY GROWTH RATES FOR EACH YEAR

1	ADAMS	17	3026.2	3346.3	3773.5	4333.9	5246.2
2	AND	17	581.7	649.3	716.9	811.1	894.1
3	ROONE	17	643.1	787.0	941.4	1127.1	1336.4
4	BROWN	17	125.7	136.6	143.0	155.9	142.9
5	BUREAU	17	1328.8	1505.3	1705.5	1943.7	2180.6
6	CALHOUN	17	571.4	633.8	678.1	739.3	800.5
7	CARROLL	17	1276.1	1437.2	1598.6	1812.2	2065.5
8	CASS	17	816.7	932.7	1053.4	1180.3	1347.1
9	CHRISTIAN	17	1863.0	2094.5	2332.7	2576.8	2906.6
10	CLINTON	17	1335.4	1500.7	1673.5	1842.0	2013.3
11	DE KALB	17	1155.4	1400.1	1690.1	2062.9	2543.9
12	FAYETTE	17	902.0	1049.2	1207.6	1451.4	1649.5
13	FULTON	17	2706.8	3030.4	3419.1	3987.9	4699.7
14	GREENE	17	575.6	630.5	691.6	749.4	811.4
15	HANCOCK	17	897.4	995.3	1090.1	1232.9	1447.2
16	HENDERSON	17	666.1	755.7	833.1	958.7	1136.4
17	HENRY	17	2388.9	2756.4	3091.1	3524.6	4079.5
18	JEFFERSON	17	1842.1	2079.2	2358.7	2657.5	3055.8
19	JERSEY	17	936.9	1054.8	1184.0	1359.1	1545.5
20	JO DAVIESS	17	1326.8	1526.3	1731.0	1952.3	2210.7
21	KNOX	17	2478.8	2831.8	3162.8	3644.4	4270.1
22	LA SALLE	17	3594.8	4109.4	4690.1	5368.9	6032.8
23	LEE	17	1354.9	1650.4	1960.2	2328.1	2744.3
24	MC DONOUGH	17	1046.2	1304.3	1522.3	1779.4	2237.9
25	MACOUPIN	17	1811.5	2083.3	2395.0	2704.5	3102.6
26	MADISON	17	9785.6	10810.0	12490.9	14665.0	16289.9
27	MARION	17	1950.3	2311.3	2621.4	2949.3	3221.6
28	MARSHALL	17	514.4	579.3	641.0	709.2	767.9
29	MASON	17	1243.5	1363.0	1565.5	1928.5	2390.9
30	MENARD	17	596.7	680.4	782.2	882.2	1018.9
31	MERCER	17	1048.8	1214.0	1378.9	1609.1	1914.0
32	MONROE	17	924.2	1044.6	1144.2	1303.1	1500.5
33	MONTGOMERY	17	1290.0	1449.4	1620.7	1794.6	2033.1
34	MORGAN	17	1161.7	1333.4	1535.2	1736.1	2005.1
35	OGLE	17	1532.5	1778.0	2036.5	2359.8	2731.5
36	PEORIA	17	7389.2	8483.4	9571.1	10805.6	12230.3
37	PERMY	17	1254.8	1384.6	1555.9	1721.6	1909.7
38	PIKE	17	853.5	931.1	1020.7	1137.4	1244.7
39	PUTNAM	17	301.0	333.8	400.3	476.1	544.1
40	RANDOLPH	17	1809.5	2049.6	2320.8	2653.5	3014.4
41	ROCK ISLAND	17	7854.2	9060.3	10269.1	11739.0	13635.8
42	ST CLAIR	17	9224.2	10244.8	11737.5	13187.3	15129.7
43	SANGAMON	17	6997.9	8162.8	9570.4	10949.0	12753.5
44	SCHUYLER	17	478.6	523.5	570.7	634.5	757.0
45	SCOTT	17	216.8	236.2	257.5	275.6	309.5
46	STARK	17	212.8	242.5	267.9	280.5	307.4
47	STEPHENSON	17	1892.8	2086.2	2364.6	2641.8	3054.7
48	WARREN	17	874.0	999.2	1107.9	1248.7	1478.2
49	WASHINGTON	17	598.0	672.0	746.9	819.5	904.3
50	WHITESIDE	17	3672.1	4274.8	4873.9	5642.2	6762.2
51	WINNEBAGO	17	7808.4	9262.2	10819.7	12638.5	14720.5
52	ALLAMAKEE	19	1361.8	1481.8	1583.3	1692.7	1805.4
53	BENTON	19	1243.6	1364.5	1442.8	1525.5	1596.6
54	BLACK HAWK	19	7884.7	8466.5	8968.8	9533.4	10092.1
55	BREMER	19	1444.5	1633.7	1755.6	1845.7	1958.3
56	BUCHANAN	19	1307.5	1430.2	1550.9	1684.3	1816.5
57	CEFAH	19	904.6	931.0	959.2	989.3	1018.3
58	CHICKASAW	19	736.7	802.0	867.6	943.7	1017.4

59	CLAYTON	19	1884.9	2049.1	2191.0	2357.5	2509.3
60	CLINTON	19	4796.8	5212.1	5544.7	6014.9	6411.9
61	DAVIS	19	323.1	354.0	378.9	404.0	425.5
62	DELAWARE	19	874.1	953.7	1042.2	1134.1	1229.9
63	DES MOINES	19	3584.9	3740.5	3877.8	4058.4	4258.7
64	DUBUQUE	19	4712.9	5180.7	5641.7	6157.9	6662.6
65	FAYETTE	19	1366.3	1463.6	1544.6	1635.7	1728.8
66	HENRY	19	872.6	904.0	937.2	984.4	1032.0
67	HOWARD	19	416.1	451.1	483.1	516.6	546.9
68	IOWA	19	706.1	749.5	791.9	837.3	883.5
69	JACKSON	19	1851.7	2011.6	2168.1	2350.4	2530.0
70	JEFFERSON	19	434.9	464.3	496.1	521.4	546.2
71	JOHNSON	19	3768.4	4145.3	4495.3	4879.6	5257.6
72	JONES	19	1053.5	1131.3	1201.0	1283.6	1368.7
73	KEOKUK	19	526.2	555.5	575.9	601.4	631.4
74	LEE	19	2398.5	2449.7	2547.2	2646.8	2801.1
75	LINN	19	10778.4	11478.5	12151.1	12965.9	13773.7
76	LOUISA	19	1098.2	1172.0	1235.7	1302.7	1369.7
77	MUSCATINE	19	3037.9	3361.7	3661.3	3973.9	4255.7
78	SCOTT	19	8338.3	9179.2	9983.8	10459.7	11690.7
79	VAN BUREN	19	446.8	458.1	470.3	487.5	507.4
80	WAPELLO	19	2167.9	2194.2	2218.8	2278.0	2354.2
81	WASHINGTON	19	931.3	940.3	950.1	979.3	1014.1
82	WINNEBIEG	19	1098.6	1145.9	1187.9	1240.5	1299.2
83	ANOKA	27	7486.7	10258.2	13492.4	16494.0	20464.4
84	HENTON	27	1911.0	2445.0	3034.2	3633.2	4229.0
85	CARVER	27	3598.2	4535.7	5688.5	7126.6	8553.4
86	CHISAGO	27	2790.7	3953.4	5463.1	6974.8	9141.3
87	DAKOTA	27	18285.8	24507.2	32596.0	41591.1	51636.1
88	DODGE	27	741.3	894.0	1041.7	1199.1	1312.1
89	FILLMORE	27	933.2	1098.1	1259.8	1399.7	1503.7
90	GOODHUE	27	3625.7	4610.3	5644.8	6807.3	8000.9
91	HENNEPIN	27	12311.2	14950.3	17538.8	19947.9	22970.3
92	HOUSTON	27	1371.3	1647.1	1949.3	2238.7	2522.4
93	ISANTI	27	106.6	147.7	196.1	252.3	317.0
94	LE SUEUR	27	494.3	663.4	842.3	1102.8	1336.4
95	MC LEOD	27	253.5	327.1	408.8	496.0	595.4
96	MEeker	27	276.6	341.9	403.4	467.4	523.9
97	MOWER	27	2425.5	3538.7	4707.9	5992.1	7485.3
98	OLMSTED	27	7151.4	9200.1	11481.3	13820.6	16243.5
99	RAMSEY	27	53985.6	65245.9	76169.1	85585.5	94419.4
100	WICE	27	4142.1	5188.1	6369.6	7643.1	9110.7
101	SCOTT	27	4451.2	5815.6	7488.0	9297.0	11274.3
102	SHEHRURNE	27	459.5	633.6	843.0	1104.3	1423.1
103	STIRLEY	27	1167.9	1484.7	1837.0	2261.9	2861.6
104	STEELE	27	2184.5	2716.5	3240.0	3733.0	4197.4
105	WABASHA	27	62.1	75.4	87.8	100.3	112.4
106	WASHINGTON	27	1140.5	1481.7	1938.7	2431.0	2966.8
107	WINONA	27	4320.2	5275.2	6211.7	7122.5	8063.9
108	WRIGHT	27	2516.0	3479.4	4699.6	5832.4	7454.2
109	ADAIR	27	544.9	728.0	903.5	1084.2	1302.0
110	AUDRAIN	29	1239.4	1489.5	1745.0	1994.9	2261.1
111	BOONE	29	3106.9	3835.6	4610.1	5415.9	6299.9
112	CALLADAY	29	1179.6	1475.4	1794.7	2132.1	2513.0
113	CLARK	29	321.2	371.9	419.4	461.3	502.7
114	FRANKLIN	29	3832.9	5233.7	6842.4	8888.3	11246.1
115	GASCONADE	29	484.7	1128.3	1405.4	1710.1	2053.0
116	JEFFERSON	29	6944.7	9596.0	12673.3	16664.6	21300.0
117	KNOX	29	93.1	106.3	118.2	128.1	137.3
118	LEWIS	29	321.7	367.0	412.3	451.7	494.7
119	LINCOLN	29	1006.2	1334.4	1700.2	2140.3	2643.8
120	MACON	29	650.1	801.0	960.9	1123.7	1308.5
121	MARION	29	1338.5	1584.6	1828.6	2059.5	2300.1
122	MONROE	29	218.7	277.1	343.9	414.7	497.5
123	MONTGOMERY	29	320.3	399.9	481.8	570.0	667.7
124	MIKE	29	933.8	1122.2	1322.3	1529.1	1722.7

125	HALLS	29	232.5	306.2	389.5	487.5	599.3
126	HANDOLPH	29	1150.2	1478.5	1842.4	2250.4	2714.3
127	ST CHARLES	29	7569.8	11150.4	15406.2	21590.8	28470.7
128	ST FRANCOI	29	1481.3	2367.8	2849.9	3455.2	4084.0
129	ST LOUIS	29	35470.9	43099.1	51030.7	58998.6	67400.5
130	STE GENEVI	29	583.9	737.4	910.3	1098.9	1310.0
131	SCHUYLER	29	114.1	148.3	183.7	227.7	274.0
132	SCOTLAND	29	92.7	110.1	127.5	144.1	161.6
133	SHELBY	29	193.8	230.3	263.2	293.6	329.1
134	WARREN	29	471.4	711.0	1002.4	1442.0	1962.7
135	WASHINGTON	29	324.0	416.2	518.4	632.9	765.3
136	ST LOUIS - C	29	6773.9	7003.6	6905.4	6794.8	6482.5
137	ADAMS	55	265.8	346.2	441.8	554.0	678.2
138	BARRON	55	2233.2	2494.7	3191.9	3799.2	4195.7
139	BUFFALO	55	1446.6	1482.8	1422.3	2151.6	2197.4
140	CHIPPewa	55	614.6	714.5	822.3	927.1	1029.9
141	CLARK	55	2211.4	2555.5	2924.1	3294.4	3617.3
142	CRAWFORD	55	1699.8	1946.7	2209.4	2451.6	2699.3
143	DUNN	55	2397.6	2755.4	3122.4	3496.1	3896.1
144	EAU CLAIRE	55	7732.9	9007.4	10314.5	11665.0	13052.4
145	GRANT	55	3484.0	4445.1	5130.7	5830.9	6529.7
146	GREEN	55	1394.4	1488.2	2009.8	2347.2	2684.4
147	IOWA	55	886.8	1019.4	1164.5	1305.5	1426.5
148	JACKSON	55	451.7	485.3	1127.4	1247.1	1374.2
149	JUNEAU	55	1925.8	2254.8	2630.4	2995.2	3353.5
150	LA CROSSE	55	8304.8	9552.1	10818.3	12077.7	13328.2
151	LAFAYETTE	55	695.1	812.8	947.9	1092.8	1199.2
152	MONROE	55	1523.0	1798.5	2090.0	2372.5	2638.8
153	PEPIN	55	671.9	766.0	875.2	966.3	1059.3
154	PIENCE	55	2179.0	2472.7	3233.7	3484.9	4447.4
155	POLK	55	1089.3	1358.5	1673.4	2007.7	2367.4
156	RICHLAND	55	903.4	990.3	1074.7	1141.7	1145.5
157	ROCK	55	9176.3	10449.1	12675.4	14549.4	16380.7
158	ST CROIX	55	3801.9	4830.3	6064.8	7435.6	8892.5
159	SAUK	55	3439.9	4001.3	4599.0	5167.2	5725.2
160	TREMPEALEA	55	1596.5	1951.2	2113.7	2391.8	2434.4
161	VERNON	55	1579.4	1821.7	2070.1	2306.2	2514.4
162	WOOD	55	4935.7	8984.2	9309.1	10531.2	11431.1

TOTAL REGISTRATIONS INTO UPPER MISSISSIPPI AREA BY YEAR AND COUNTY

1	ADAMS	140	193	240	287	347
2	BOND	4	5	6	7	8
3	BOONE	2	4	5	7	8
4	BROWN	4	6	7	8	9
5	BUREAU	23	32	41	48	54
6	CALHOUN	19	26	31	35	38
7	CARROLL	47	66	81	95	108
8	CASS	16	22	28	32	37
9	CHRISTIAN	10	14	17	19	22
10	CLINTON	4	5	6	7	8
11	DE KALB	6	10	13	17	21
12	FAYETTE	2	3	4	5	6
13	FULTON	56	77	96	116	137
14	GREENE	17	24	29	32	35
15	HANCOCK	34	47	57	67	80
16	HENDERSON	28	40	44	58	69
17	HENRY	96	138	170	202	234
18	JEFFERSON	1	2	3	3	4
19	JERSEY	22	31	38	46	52
20	JO DAVIESS	44	64	81	95	107
21	KNOX	77	107	132	157	184
22	LA SALLE	17	25	32	37	42
23	LEE	21	31	40	50	59
24	MC DONOUGH	34	53	68	83	104
25	MACOUPIN	26	37	47	55	63
26	MADISON	133	181	231	281	312
27	MARION	1	2	3	4	4
28	MARSHALL	2	3	4	5	5
29	MASON	11	14	19	24	30
30	MENARD	5	8	10	12	14
31	MERCER	46	66	83	101	120
32	MONROE	6	8	10	13	15
33	MONTGOMERY	9	13	16	18	21
34	MORGAN	20	28	35	42	48
35	OGLE	22	31	39	47	54
36	PEORIA	114	162	201	234	265
37	PERRY	1	1	2	2	2
38	PIKE	32	43	52	61	72
39	PUTNAM	2	3	4	5	6
40	RANDOLPH	4	6	7	9	10
41	ROCK ISLAND	389	560	700	833	968
42	ST CLAIR	88	122	154	180	207
43	SANGAMON	59	85	111	130	151
44	SCHUYLER	13	17	21	25	29
45	SCOTT	6	8	10	11	13
46	STARK	4	6	7	8	9
47	STEPHENSON	34	54	67	79	90
48	WARREN	29	41	50	60	70
49	WASHINGTON	1	2	3	3	3
50	WHITESIDE	139	202	253	307	355
51	WINNEBAGO	81	118	153	184	214
52	ALLAMAKEE	58	78	92	103	110
53	BENTON	15	20	23	25	26
54	BLACK HAWK	74	98	117	126	134
55	BREMEN	15	21	25	27	29
56	HUCHANAN	22	24	35	39	42
57	CEDAR	34	50	57	61	63
58	CHICKASAW	12	16	19	21	23

59	CLAYTON	74	103	121	135	144
60	CLINTON	229	310	366	410	437
61	DAVIS	4	6	7	7	8
62	DELAWARE	29	40	48	55	60
63	DES MOINES	166	214	245	267	280
64	DUBUQUE	202	275	331	375	406
65	FAYETTE	36	47	55	61	64
66	HENRY	29	38	43	47	50
67	HOWARD	8	11	13	14	15
68	IOWA	8	10	12	13	14
69	JACKSON	80	109	129	146	157
70	JEFFERSON	21	26	28	30	30
71	JOHNSON	100	136	162	182	196
72	JONES	41	54	63	70	75
73	KEOKUK	7	9	10	11	12
74	LEE	92	118	134	146	153
75	LINN	296	384	447	494	524
76	LOUISA	44	50	60	75	79
77	MUSCATINE	134	184	221	249	267
78	SCOTT	470	644	772	875	942
79	VAN BUREN	12	15	17	18	18
80	WAPELLO	22	28	31	33	34
81	WASHINGTON	24	29	33	35	37
82	WINNEBIEG	41	53	61	66	69
83	ANOKA	307	511	742	968	1172
84	HENTON	24	38	52	65	76
85	CARVER	98	154	216	277	332
86	CHISAGO	85	151	229	304	399
87	DAKOTA	837	1401	2050	2724	3382
88	DODGE	23	34	44	51	57
89	FILLMORE	39	57	73	83	90
90	GOODHUE	174	272	369	461	542
91	HENNERIN	520	814	1057	1244	1386
92	HOUSTON	72	108	141	169	191
93	ISANTI	2	4	7	9	12
94	LE SUEUR	14	24	32	39	43
95	MC LEOD	4	6	8	11	13
96	MEEKEN	2	3	4	5	6
97	MONROE	67	99	127	146	159
98	OLMSTED	298	475	652	815	958
99	RAMSEY	2899	4371	5636	6598	7279
100	RICE	143	217	284	343	394
101	SCOTT	173	283	401	518	624
102	SHERBURNE	9	16	23	32	41
103	SIBLEY	19	28	37	43	48
104	STEELE	52	79	104	124	139
105	WABASHA	3	5	6	7	8
106	WASHINGTON	57	93	134	175	214
107	WINONA	233	355	460	549	622
108	WRIGHT	59	101	151	195	249
109	ADAIR	7	12	16	21	25
110	AUDRAIN	25	36	47	56	63
111	BOONE	18	28	37	45	52
112	CALLAWAY	19	16	21	26	31
113	CLARK	11	17	21	24	26
114	FRANKLIN	34	57	82	111	140
115	GASCONADE	6	9	13	16	20
116	JEFFERSON	48	81	119	161	206
117	KNOX	2	3	4	4	4
118	LEWIS	11	15	19	22	24
119	LINCOLN	30	50	70	92	113
120	MACON	6	9	12	15	18
121	MARION	43	64	91	125	166
122	MONROE	4	7	10	12	15
123	MONTGOMERY	6	9	12	14	17

124	PIKE	31	47	61	73	83
125	RALLS	8	13	18	24	30
126	RANDOLPH	10	17	23	29	34
127	ST CHARLES	177	325	496	723	967
128	ST FRANCOI	5	8	11	14	17
129	ST LOUIS	482	724	944	1132	1297
130	STE GENEVI	1	2	3	4	5
131	SCHUYLER	1	2	2	3	4
132	SCOTLAND	1	2	3	4	4
133	SHELBY	5	7	9	11	12
134	WARREN	9	17	27	41	56
135	WASHINGTON	0	1	2	2	3
136	ST LOUIS C	92	117	127	130	124
137	ADAMS	1	2	3	4	5
138	BARRON	52	76	100	120	136
139	BUFFALO	71	102	124	150	167
140	CHIPPEWA	8	11	15	17	19
141	CLARK	24	38	47	55	60
142	CRAWFORD	44	68	123	143	158
143	DUNN	75	107	133	154	172
144	EAU CLAIRE	208	293	372	435	486
145	GRANT	146	212	270	319	357
146	GREEN	23	33	44	53	61
147	IOWA	22	31	40	46	51
148	JACKSON	26	37	47	55	60
149	JUNEAU	25	35	46	54	60
150	LA CROSSE	411	591	737	857	946
151	LAFAYETTE	22	32	41	49	55
152	MONROE	47	69	88	104	115
153	PEPIN	33	47	59	68	75
154	PIENCE	110	167	223	277	327
155	POLK	26	39	53	66	78
156	RICHLAND	24	35	47	46	48
157	ROCK	59	86	112	132	149
158	ST CROIX	151	239	330	421	504
159	SAUK	44	64	81	94	104
160	TREMPEALEA	66	95	119	140	154
161	VERNON	56	80	101	116	127
162	WOOD	38	54	70	81	89

TOTAL REGISTRATIONS INTO UPPER MISSISSIPPI AREA BY YEAR AND BY POOL

POOL 51	1062	1656	2225	2726	3149
POOL 52	1075	1676	2254	2763	3193
POOL 1	1054	1641	2197	2688	3100
POOL 2	1097	1711	2304	2833	3282
POOL 3	854	1326	1775	2180	2526
POOL 4	631	949	1262	1537	1772
POOL 5	448	674	881	1059	1209
POOL 5A	407	611	805	968	1108
POOL 6	334	495	641	755	849
POOL 7	369	534	694	816	916
POOL 8	313	453	577	675	753
POOL 9	272	388	485	561	619
POOL 10	245	396	486	555	606
POOL 11	345	475	579	661	722
POOL 12	402	554	676	778	858
POOL 13	400	556	683	795	889
POOL 14	450	641	781	906	1012
POOL 15	444	617	751	869	972
POOL 16	458	629	762	876	974
POOL 17	411	561	673	767	846
POOL 18	353	484	582	670	750
POOL 19	263	358	430	492	550
POOL 20	158	219	272	316	363
POOL 21	188	265	339	398	461
POOL 22	189	276	360	437	519
POOL 24	294	438	571	704	836
POOL 25	429	637	841	1047	1246
POOL 26	645	978	1289	1613	1913

FINAL OUTPUT
(Slippage Forecast)

P00L	51	.00	.00	.00	.00	.00	.00	.00	.00
P00L	52	.00	.00	.00	.00	.00	.00	.00	.00
P00L	1	.00	.00	.00	.00	.00	.00	.00	.00
P00L	2	1574.14	2424.16	3239.49	3936.08	4516.76			
P00L	3	3302.94	5103.10	6434.44	8352.90	9644.60			
P00L	4	1279.72	1946.21	2581.58	3137.74	3614.39			
P00L	5	11.53	17.26	22.50	26.99	30.74			
P00L	5A	76.88	114.85	149.35	178.84	203.28			
P00L	6	514.39	762.47	985.12	1174.99	1331.24			
P00L	7	46.71	68.86	88.50	105.09	118.58			
P00L	8	799.14	1169.82	1498.55	1774.35	1997.85			
P00L	9	174.97	253.60	323.02	381.07	428.50			
P00L	10	614.09	882.06	1114.23	1309.05	1466.70			
P00L	11	184.74	261.41	325.75	379.20	422.30			
P00L	12	813.01	1139.70	1410.35	1638.57	1826.54			
P00L	13	167.44	234.05	287.66	333.45	373.36			
P00L	14	727.41	1014.07	1250.66	1455.24	1634.26			
P00L	15	312.75	436.45	534.06	619.32	691.97			
P00L	16	576.17	805.22	986.33	1144.69	1283.21			
P00L	17	105.77	146.38	178.10	205.14	228.25			
P00L	18	91.22	125.59	152.16	175.70	197.04			
P00L	19	264.42	360.60	433.67	497.37	554.90			
P00L	20	62.14	86.49	106.45	124.42	142.20			
P00L	21	152.17	215.15	268.73	317.74	367.20			
P00L	22	72.01	102.57	129.04	153.68	178.85			
P00L	24	56.39	80.67	102.10	122.27	142.81			
P00L	25	72.84	107.43	139.72	172.02	204.17			
P00L	26	1518.1	2260.71	2922.45	3601.55	4325.29			

GRAVITY MODEL PROGRAM

```

PROGRAM GRAVITY(INPUT,OUTPUT,TEMP,TEMP2,TAPE1=INPUT,TAPE3=OUTPUT,

```

```

  TAPE7=TEMP,TAPE5=TEMP2)

```

```

  DIMENSION IDEM(162,5),ISUP(28,5),ICOUNTY(162),ISTATE(162),

```

```

  1 IYFAR(5)

```

```

  DIMENSION MARINA(28)

```

```

  DIMENSION TOTDFG(162,28,5),PERCENT(30)

```

```

  DIMENSION IYAR(30,2),CNOO(162),ST(30), TLF(75)

```

```

  DIMENSION AFIN(28,5)

```

```

  1 DJSP(75),FFCT(75),AFIN(30),ADUT(30),AIN(30),AORG(30),ITR(30)

```

```

  DATA IYFAR/4H1980,4H1985,4H1990,4H1995,4H2000/

```

```

  DATA MARINA/2H51,2H52,2H 1,2H 2,2H 3,2H 4,2H 5,2H 6,2H 7,

```

```

  12H 8,2H 9,2H10,2H11,2H12,2H13,2H14,2H15,2H16,2H17,2H18,2H19,2H20,

```

```

  22H21,2H22,2H24,2H25,2H26/

```

```

  1 FORMAT(2I3,1X,11,2X,F10.8,2X,11,5X,F2,0.4X,F2,2,2X,F11,0X,11,

```

```

  14X,11)

```

```

  2 FORMAT(14,15X,13,17X,13,27X,11)

```

```

  3 FORMAT(13,F6,1,6X,11)

```

```

  4 FORMAT(12,F3,2,6X,11)

```

```

  5 FORMAT(12,F4,1,6X,11)

```

```

  6 FORMAT(16,1,65X,11)

```

```

  7 FORMAT(3I3,13,8X,13,14X,11,6X,F7,1,F5,0)

```

```

  8 FORMAT(1M1,4X,42HRECREATION NAME

```

```

  14X,63M AREA NO

```

```

  INCF)

```

```

  9 FORMAT(1M 4X,15,3X,A10,3X,A10,2)

```

```

  11 FORMAT(5M1,WHLES FF OD MOREL RATIO)

```

```

  13 FORMAT(1M 15,AF10,2)

```

```

  14 FORMAT(10M 0-D ATL=F9,1,10M COMPATL=F6,1, 8H RATIO =F6,2)

```

```

  17 FORMAT(11M ERROR NO, 14,21M-CORRECT AND RESTART)

```

```

  21 FORMAT(4M R = F4,2, 8H YHAR = F7,2, 8H SLOPE = F7,4, 8H XHAR =

```

```

  1,F7,2)

```

```

  23 FORMAT(12,16,61X,11)

```

```

  27 FORMAT(1M 13,F7,2)

```

```

  29 FORMAT(10M10IST FF)

```

```

  31 FORMAT(10M1 TRIPS)

```

```

  33 FORMAT(1M 15,11F10,1)

```

```

  35 FORMAT(12,F4,1,63X,11)

```

```

  F2,718PR

```

```

  READ(1,1)INA,NP,IPF,AL,ICF,OK,PCER,NCD,ITRQ,ITP

```

```

  WRITE(3,10)INA,NP,IPF,AL,ICF,OK,PCER,NCD,ITRQ,ITP

```

```

  101 FORMAT(1M1,2I3,1X,11,2X,F10,8,2X,11,5X,F2,0.4X,F3,2,2X,11,4X,

```

```

  211,4X,11)

```

```

  43 IF(ITRQ - 4) 10,15,10

```

```

  10 IF(NCD - 1) 10,83,17

```

```

  10 IP=1

```

```

  6, 10 900

```

```

  15 CALL DEMAND(IDEM,ISUP,ICOUNTY,ISTATE,IYFAR,NP,NA,TOTDFG,MARINA)

```

```

  DO 36 NI=1,5

```

```

  WRITE(3,37)

```

```

  37 FORMAT(1M1)

```

```

  REWIND 5

```

```

  ITCO=0

```

```

  POTAF=0

```

```

  POTIP=0

```

```

  OK=0

```

PROGRAM GRAVITY

```

MICD=5
DO 90 I=1,NP
  READ (5,22) I1,(I1R(I),J=1,NA)
  22 FORMAT(13,X,14(2X,13)/10X,14(2X,13))
  WRITE(3,1102)I1,(I1R(J),J=1,NA)
  1102 FORMAT(1H,13,1X,2A(1X,13))
  WRITE (7) I1R
  90 CONTINUE
  65 DO 90 I=1,NP
    98 C00D(I)=IDEN(I,N1)
    P0TP=P0TP + C00D(I)
    90 CONTINUE
    19 DO 100 I=1,NA
      READ(5,107)PFRCT(I),NCD
      107 FORMAT(3X,F7.0,S9X,11,10X)
      IF(NCD - 3) 98,100,98
      98 IR=7
      GO TO 900
      108 AORG(I)=P0TP * PFRCT(I) * .01
      WRITE(3,109) I, MARINA(I), PFRCT(I), NCD
      109 FORMAT(1H,12,3X,A10,3X,F5,2,4X,11)
      P0TA=P0TA + AORG(I)
      100 CONTINUE
      80 DO 120 I=1,75
        DIFF=P0TA - P0TP
        READ(5,35)ITEM,FF,NCD
        WRITE(3,1104) ITEM,FF,NCD
        1104 FORMAT(1H,12,F4,1,63X,11)
        IF(NCD-5)116,118,116
        116 IR=9
        118 IF(1-ITEM)110,112,110
        110 IR=10
        GO TO 900
        112 FFCT(I)=FF
        120 CONTINUE
        DO 140 I=1,75
          READ(5,5)ITEM,FFQ,NCD
          WRITE(3,105) ITEM,FFQ,NCD
          105 FORMAT(1H,12,F4,1,63X,11)
          IF(NCD-6)144,144,144
          144 IR=13
          GO TO 900
          148 IF(1-ITEM)144,145,144
          144 IR=14
          GO TO 900
          145 TLF(I)=FRFQ
          140 CONTINUE
          COUNT=0.0
          AT1=0.0
          HEWIND 7
          DO 1106 I=1,NP
            READ (7) I1R
            DO 1106 J=1,NA
              DIST=I1R(I,J)
              COUNT=COUNT + TOTREK(I,J,N1)
            110

```

```

1106  ATL=ATL + DIST*TOTREG(I,J,N1)
1107  CONTINUE
1108  ATL=ATL/COUNT
1109  WRITE(3,1107) ATL
1110  FORMAT(1M, 'DANAVRAGE TRIP LENGTH(MIATL)=',F6.2)
1111  IF (ICF-4) 124,125,124
1112  DO 127 I=1,NA
1113  READ(1,1104)TE,NCD
1114  WRITE(3,1103)NO,IF,NCD
1115  FORMAT(1M, '13.F6.1,60x.11)
1116  IF (NCD-N) 129,131,129
1117  IF 1P=15
1118  GO TO 900
1119  131 IF (1-NO) 133,135,133
1120  133 IF 1P=14
1121  GO TO 900
1122  135 ATN(1)=TF
1123  CONTINUE
1124  DO 200 I=1,NA
1125  AIN(I)=AORG(I)
1126  AOUT(I)=AORG(I)
1127  DO 320 J=1,N
1128  ITR=ITER + 1
1129  DO 220 I=1,NA
1130  AIN(I)=AIN(I)+AORG(I)+AOUT(I)
1131  DO 224 I=1,NA
1132  AOUT(I)=0.
1133  AIN(I)=AIN(I)
1134  DO 226 I=1,75
1135  DISP(I)=0.
1136  TL=0.
1137  TOT=0.
1138  REWIND 7
1139  IF (OR (67, 0,0) WPITF(3,31)
1140  DO 300 I=1,ND
1141  SUM=0.
1142  READ(7) ITR
1143  DO 230 J=1,NA
1144  IM=ITR(J) + 9)/10
1145  FF=FFCT(IM)
1146  SUM=SUM+FF*AIN(J)
1147  CONTINUE
1148  FCT=C000(I)/SUM
1149  DO 300 J=1,NA
1150  IM=ITR(J) + 9)/10
1151  TRIPS=FFCT*(AIN(J)+FFCT(IM))
1152  ST(J)=TRIPS
1153  AOUT(J)=AOUT(J)+TRIPS
1154  DST=ITR(J)
1155  TL=TL+DST*TRIPS
1156  DISP(IM)=DISP(IM)+TRIPS
1157  TOT=TOT+TRIPS
1158  IF (OR (300, 100, 24,0
1159  IF (TRIPS=0, 1) 100, 24,0, 24,0
1160  IF (TRIPS=0, 1) 100, 24,0, 24,0

```

PROGRAM GRAVITY

250 WRITE(3,7)I,J,ITP,TRIPS,DST

300 CONTINUE

304 CONTINUE

WRITE(3,8)

OFF=0.

DO 310 I=1,NA

ONE=AOUT(I)/AORG(I)

DIFF=AOUT(I) - AORG(I)

WRITE(3,9) I,MARINA(I),AORG(I),AOUT(I),ONE,DIFF

IF (ITER.EQ. 1) AFIN(I,N1)=AOUT(I)

A=1. - ONE

ONE=ARS(R)

310 OFF=OFF+ONE

IF (OFF-127) 325,325,320

320 CONTINUE

325 IF (OK.GT. 0.0) GO TO 500

WRITE(3,11)

VAR=0.0

AV=0.

AVSQ=0.0

J=0

DO 345 I=1,75

PC=(DISP(I)*100.0)/TOT

IF (PC) 36,330,335

330 RAT=0.0

GO TO 340

335 Z=TLF(I)

IF (Z) 36,336,340

336 RAT=0.99999.

GO TO 348

340 RAT=PC/TLF(I)

IF (RAT) 344,348,350

350 FECT(I)=FECT(I)/RAT

AV=AV + RAT

J=J + 1

AVSQ =AVSQ + RAT**2

344 WRITE(3,13)I,FECT(I),TLF(I),PC,RAT

345 CONTINUE

AJ = J

AV=AV/AJ

346 VAR=(AVSQ/AJ - AV**2)**.5

IF (ARS(VAR) .LT. 1.0) OK=1.0

352 CATL=TL/TOT

RATIO=CATL/ATI

WRITE(3,14)ATL,CATL,RATIO

WRITE(3,1110) AV,VAR

1110 FORMAT(1H0.5HMEAN=F10.5,5X,19HSTANDARD DEVIATION=F10.5)

A=1. - RATIO

A=ARS(A) - .02

IF (A .LT. .70) OK=1.

GO TO 123

500 CONTINUE

34 CONTINUE

WRITE(3,50) (I,VAR*(1+K-1),5)

500 CONTINUE

34 CONTINUE

PROGRAM

GRAVITY

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50 FORMAT(1H1.10X.3HHPOTENTIAL SLIP PENTAL MARKET FOR LOCK /
113X.33MPPOOLS ALONG THE MISSISSIPPI RIVER//19X.5(44.6X))

DO 55 I=1,NA

WRITE(3,52) MARINA(1).((AFIN(1,N1)).N1=1.5)

52 FORMAT(6H POOL *2X.A2*2X.5F10.2)

55 CONTINUE

STOP

900 WHITE(3.17)IR

99999 STOP

END

225

230

AD-A128 079

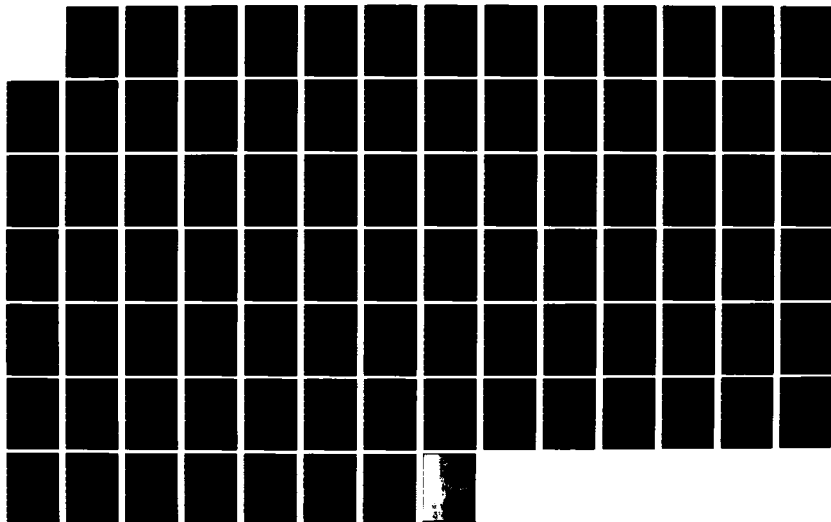
METHODOLOGY AND FORECASTS OF RECREATION USE AND SMALL
CRAFT LOCKAGES ON T. (U) MIDWEST RESEARCH INST KANSAS
CITY MO R M MISCHON 26 JUL 78 DACW37-77-C-0075

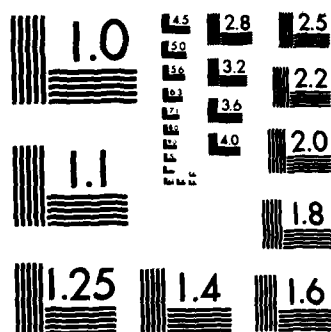
2/2

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NL





```

      SURROUTINE DEMAND(I,DEM,ISUP,ICOUNTY,ISTATE,IYEAR,MP,NA,TOTREG,
      * MARINA)
      INTEGER GROSST
      DIMENSION ICOUNTY(162),ISTATE(162),IYEAR(5),GROSST(5)
      DIMENSION IOWM(162),ISUP(28),POP(162,5),GROW(5,5),PFNETH(6,5),
      IINDST(162,28),TOTPEN(5),TOTREG(162,28,5),MARINA(28)
      DIMENSION DFM(162,5),SUP(28,5)

      C**** INITIALIZE ARRAY
      C
      DO 10 I=1,MP
      DO 10 J=1,5
      10 POP(I,J)=0.0
      C
      C**** READ POPULATIONS IN THOUSANDS
      C
      WRITE(3,22)
      22 FORMAT(1H,20X,30HPOPULATION DATA IN THOUSANDS OF PERSONS ,//)
      DO 29 I=1,MP
      READ(1,25) ICOUNTY(I),ISTATE(I),POP(I,J),J=1,5)
      25 FORMAT(10X,12, 4X,5(F6,1,4X))
      WRITE(3,27) I,ICOUNTY(I),ISTATE(I),POP(I,J),J=1,5)
      27 FORMAT(1H, 13,2X,A10,3X,12,5(5X,F7,1))
      29 CONTINUE
      C
      C**** CONVERT TO ROAT REGISTRATIONS
      C
      WRITE(3,32)
      32 FORMAT(1H,20X,30HPER THOUSAND CAPITAL ROAT REGISTRATIONS ,//)
      DO 39 I=1,MP
      READ(1,35) REG
      35 FORMAT(6X,F4,1)
      DO 38 J=1,5
      38 POP(I,J)=POP(I,J)*REG
      WRITE(3,37) I,ICOUNTY(I),ISTATE(I),POP(I,J),J=1,5)
      37 FORMAT(1H, 13,2X,A10,3X,12,5(5X,F7,1))
      39 CONTINUE
      C
      C**** CONVERT FOR GROWTH RATES
      C
      WRITE(3,42)
      42 FORMAT(1H,20X,32HAPPLY GROWTH RATES FOR EACH YEAR ,//)
      DO 51 J=1,5
      READ(1,45)(GROW(J),J=2,5),GROSST(J)
      51 CONTINUE
      DO 49 I=1,MP
      DO 49 K=1,5
      IF(GROSST(K).EQ. ISTATE(I)) GO TO 53
      52 CONTINUE
      53 DO 44 J=1,5
      POP(I,J)=POP(I,J)*GROW(K,K)
      45 FORMAT(1X,5(F4,2,4X),12)
      44 CONTINUE
      WRITE(3,46) I,ICOUNTY(I),ISTATE(I),POP(I,J),J=1,5)
      46 FORMAT(1H, 13,2X,A10,3X,12,5(5X,F7,1))

```

```

C
C 49 CONTINUE
C
C ***** HEAD PENETRATION RATES
C
C 60 DO 59 J=1,5
C     HEAD(1:55)=VFAR(J)*DEPMTH(1,J)*I=100)
C     55 FORMAT(1A,1X,6(F5.4,5X))
C     59 CONTINUE
C
C 65 C ***** HEAD DISTANCE CATEGORIES FROM EACH COUNTY TO EACH MARINA
C
C     WRITE(13,62)
C     62 FORMAT(1M1,20X,5#DISTRICTED HOAT REGISTRATIONS BY YEAR AND BY
C     MARINA)
C     DO 69 I=1,NP
C     HEAD(1:65)=IDIST(1,J,J=1,NA)
C     65 FORMAT(9X,20F11)
C     DO 68 J=1,5
C     TOTPEN(J)=0.0
C     DO 67 K=1,NA
C     L=IDIST(1,K)
C     TOTPEN(J)=TOTPEN(J)+POP(1,J)*DEPMTH(1,K,J)
C     67 CONTINUE
C     68 CONTINUE
C     69 CONTINUE
C
C 70 C ***** SUM TO COMPUTE TOTAL REGISTRATIONS PROJECTED BY COUNTY AND YEAR
C
C     WRITE(13,72)
C     72 FORMAT(1M1,20X,6#TOTAL REGISTRATIONS INTO UPPER MISSISSIPPI AREA
C     1 BY YEAR AND COUNTY.//)
C     1 AND COUNTY.//)
C     DO 76 I=1,NP
C     DO 75 J=1,5
C     DEM(1,J)=0.0
C     DO 74 K=1,NA
C     DEM(1,J)=DEM(1,J)+TOTPEN(1,K,J)
C     74 CONTINUE
C     75 CONTINUE
C     DO 79 J=1,5
C     TOTM(1,J)=DEM(1,J)
C     79 FORMAT(13,2X,A10,3X,A2,5(5X,17))
C     76 CONTINUE
C
C 100 C ***** SUM TO COMPUTE TOTAL REGISTRATIONS PROJECTED BY MARINA AND YEAR
C
C     WRITE(13,82)
C     82 FORMAT(1M1,20X,6#TOTAL REGISTRATIONS INTO UPPER MISSISSIPPI AREA
C     1 BY YEAR AND BY MARINA.//)
C     DO 86 I=1,NA
C     DO 85 J=1,5
C     SUP(1,J)=0.0
C     DO 84 K=1,NP
C     SUP(1,J)=SUP(1,J)+TOTPEN(1,K,J)
C     84 CONTINUE
C     85 CONTINUE
C     86 CONTINUE

```

SUBROUTINE DEMAND

CDC 6600 FIN V 3.0-P 365 001=1 00/20/77. 20.000/1. PAGE 3

```

K4 CONTINUE
K5 CONTINUE
DO K9 J=1,5
  K9 ISUP(I,J)=SQIP(I,J)
  WRITE(3,RT) MARINA(1),(ISUP(I,J),J=1,5)
  K7 FORMAT(1H,5HP00L,42.5X,5(5X,17))
  K6 CONTINUE
  RTURN
END
```

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APPENDIX E

RECREATION LOCKAGE FORECASTING MODEL AND OUTPUTS

The computer documentation and forecasts for the recreation lockage model is contained in this appendix. The methodology incorporates the coefficients derived through regression analysis and applies them to future estimates of five variables. The forecasting technique is split into two separate models. These models are described below:

1. Pleasure Boats Through the Locks: The forecasting model utilized to estimate pleasure boats through the locks contains five variables, including:

Variable

- 1 Flow factor (survey data, summer 1977)
- 2 Potential marina slip market (gravity model output--see Appendix D)
- 3 Forecast of commercial lockage (provided by the St. Paul District)
- 4 Quality of the pools (upstream)
- 5 Average miles to the next lock (above and below)

The equation is as follows:

$$\begin{aligned} \text{Pleasure boats} = & 7,601.41 - 2494.26 (\text{Variable 1}) + \\ & 2.99 (\text{Variable 2}) - 0.731 (\text{Variable 3}) + \\ & 584.20 (\text{Variable 4}) - 166 (\text{Variable 5}) \end{aligned}$$

Variable 2 (Potential slip market) comes directly from the gravity output. However, prior to incorporating it into the forecasting model it was converted to the number of slips both above and below a lock. Conversion of the gravity output (1980) for the first five locks is shown below:

<u>Lock</u>	1980	<u>Potential Slip Market (above and below the locks)</u>
	<u>Gravity Output (Appendix D)</u>	
51	0 ^{a/}	0
52	0 ^{a/}	0
1	0 ^{a/}	1,574
2	1,574	4,877
3	3,303	4,583
etc.	etc.	etc.

a/ Potential marina slip market of Locks 51, 52 and 1 constrained to 0.

The forecasting model provides 5 years (1980, 1985, 1990, 1995 and 2000) and includes data for the remaining four variables described above. The variables in the forecasting equation subject to major changes during the forecast period are the potential slips per pool (above and below) and the forecast of commercial lockages. Although the data are not available, the long-distance flow factor may change. For this reason a periodic survey is recommended to improve the model validity. The model as presently conceived only incorporates flow based on the survey conducted during the summer of 1977.

The final step of the first equation is to subject the model output for each lock to a calibration factor. These factors were developed by utilizing the model with 1977 data and adjusting the outputs to correspond to 1977 actual Pleasure Boats through the locks as shown below:

<u>Lock</u>	<u>1977 Pleasure Boats (Actual)</u>	<u>1977 Pleasure Boats (Model)</u>	<u>Calibration Factor</u>
51	1,580	3,971	0.41
52	1,491	3,376	0.44
1	3,366	2,168	1.55
2	7,848	7,015	1.12
3	10,947	10,540	1.04
4	7,199	9,217	0.78
5	6,189	5,619	1.10
5A	8,114	6,571	1.23
6	6,494	6,809	0.95
etc.	etc.	etc.	etc.

The computer program is shown on the following page. The basic data for the five variables are included on 28 separate cards (one card for each pool on the Upper Mississippi River) and are shown on the page following the program.

2. Pleasure Boat Lockages: The results of the previous forecasts are output into a single table described as "Pleasure Boats Through the Locks." It provides a matrix of 28 locks by five separate forecast years. The data in this matrix are then subjected to a second equation which converts pleasure boats through the locks to the number of recreation lockages. This equation utilizes the regression coefficients described in Appendix C. The equation accomplishing this conversion is:

$$\text{Lockages} = \text{pleasure boats (see equation above)} \times$$

$$0.3452 + 412.86$$

The results of this conversion are output into a second table called "Pleasure Boat Lockages." This is a matrix of 28 locks by five forecast years.

PROGRAM ONE - PLEASURE BOATS THROUGH THE LOCKS

```

LCKCST,CM50000,T10.
ACCOUNT,M350644,MICKEYM,43870.
UNIFORE.
COPYBR,INPUT,TAPE5.
RE=IND,TAPE5.
LGO.
RE=IND,TAPE9.
COPYSBF,TAPE9.
REWIND,TAPE=.
RENAME,TAPE5=TAPEH.
REWIND,TAPE5.
RETURN,LGO.
UNIFORE.
LGO.
RPL,10000.
COST.
EXIT.
RPL,10000.
COST.
6
PROGRAM ADAMS(INPUT,OUTPUT,TAPE5,TAPE5=OUTPUT,TAPE9)
DIMENSION SRMKT(5),COMML(5)
INTEGER PROATS(5)
3 FORMAT('1',1X,32HPLEASURE BOATS THROUGH THE LOCKS)
WRITE(6,3)
4 FORMAT('0',5X,4HLOCK,6X,4H1980,5X,4H1985,5X,4H1990,5X,4H1995,5X,4H
C2000)
38 FORMAT(' ')
WRITE(6,4)
WRITE(6,5)
1 FORMAT(A2,10(1X,F5.0),F4.2,F5.2,1X,F3.1,F5.2)
100 READ (5,1,END=99)LOCK,SRMKT,COMML,FLOW,QUAL,AVGMI,CFACT
DO 10 I=1,5
10 PROATS(I) = (7501.41 - 2494.26 * FLOW + 2.99 * SRMKT(I)
C -0.731 * COMML(I) + 584.20 * QUAL - 166 * AVGMI) * CFACT
WRITE(6,70)LOCK,(PROATS(I),I=1,5)
70 FORMAT(1X,A4,2X,5(15,2X))
WRITE(6,2)LOCK,(PROATS(I),I=1,5)
2 FORMAT(' ',5X,1X,A4,5(3X,16))
GOTO 100
99 STOP
END

```

DATA DECK LEGEND

1. Lock
2. Potential Slip Market (Gravity Model)--1980 to 2000
3. Commercial Lockages (St. Paul District)--1980 to 2000
4. Flow Factor (Survey, Summer 1977)
5. Quality of Pools (Upstream)
6. Miles to Next Lock (Above and Below)
7. Calibration Factor (1977)

DATA DECK

1	2		3				4	5	6	7		
51	0	0	0	2140	2120	2310	2370	2430	97	107	3	0.40
52	0	0	0	2290	2390	2450	2550	2600	97	101	30	0.44
1	1574	2429	3239	3936	4517	2520	2780	2830	97	122	190	1.55
2	4877	7532	10073	12289	14162	2630	2790	3110	97	269	254	1.12
3	4583	7049	9416	11491	13259	2780	2910	3130	97	583	313	1.40
4	1292	1963	2605	3165	3645	2890	3020	3240	97	1101	294	0.78
5	89	132	172	206	234	3420	3550	3740	97	641	121	1.10
5A	591	877	1134	1354	1534	3200	3330	3500	97	536	121	1.23
6	561	831	1074	1280	1450	2930	3250	3430	97	622	130	0.95
7	846	1239	1588	1880	2117	3550	3700	3900	97	777	175	1.28
8	974	1424	1822	2156	2427	3160	3300	3480	97	948	273	0.72
9	789	1136	1437	1690	1896	3260	3380	3550	97	1145	321	0.91
10	799	1143	1440	1688	1889	3230	3360	3540	97	1069	325	1.38
11	998	1401	1736	2018	2249	3330	3440	3570	105	774	291	1.05
12	980	1374	1694	1973	2200	3880	4020	4190	105	566	303	1.00
13	894	1253	1539	1749	2007	3250	3380	3520	105	1058	317	1.05
14	1040	1455	1765	2074	2326	4950	5160	5470	105	647	198	1.73
15	889	1241	1520	1764	1975	5460	5620	6010	105	334	180	2.03
16	682	951	1164	1350	1511	4920	5100	5420	105	755	230	0.53
17	197	272	330	381	425	4660	4850	5140	105	602	234	0.90
18	355	487	580	673	752	5000	5210	5550	105	799	364	1.31
19	326	447	540	621	697	3570	3750	4060	105	575	336	0.71
20	214	301	375	442	509	5610	5990	6390	105	375	196	0.59
21	224	318	398	472	546	5780	6190	6810	105	681	210	0.49
22	128	184	231	276	322	5740	6050	6630	105	569	254	0.89
24	129	189	242	294	347	5960	6300	6930	105	586	299	1.60
25	1591	2369	3102	3834	4532	5970	6300	6940	105	629	353	1.40
26	1514	2261	2962	3662	4424	15790	17700	21450	105	934	345	1.37

PROGRAM TWO - PLEASURE BOAT LOCKAGES

```

PROGRAM TWO(INPUT,OUTPUT,TAPF5,TAPE6=OUTPUT)
INTEGER ANS(5)
REAL PROATS(5)
3  FORMAT("1",19A,22HPLEASURE BOAT LOCKAGES)
   WRITE(6,3)
4  FORMAT("0",5X,4HLOCK,6X,4H1980,5X,4H1985,5X,4H1990,5X,4H1995,5X,4H
C2000)
   WRITE(6,4)
   WRITE(6,88)
   FORMAT(" ")
88  READ(5,70,END=99)LOCK,PROATS
70  FORMAT(1X,A4,2X,5(F5.0,2X))
   DO 10 I = 1,5
10  ANS(I) = PROATS(I) * .3452 + 412.86
   WRITE(6,2)LOCK,(ANS(J),J=1,5)
2   FORMAT(" ",5X,1X,A4,5(3X,I6))
   GO TO 1
99  STOP
   END

```

FORECASTS

PLEASURE BOATS THROUGH THE LOCKS

LOCK	1980	1985	1990	1995	2000
51	1677	1683	1627	1609	1592
52	1584	1551	1532	1500	1484
1	8687	12538	16166	19339	21975
2	17020	25780	34166	41448	47581
3	21088	31277	41042	49646	56965
4	6617	8108	9531	10786	11854
5	5152	5189	5216	5280	5331
5A	7051	7986	8823	9587	10204
6	5883	6428	7028	7578	8026
7	8640	10004	11209	12270	13130
8	4889	5784	6572	7265	7822
9	5931	6796	7528	8190	8724
10	8362	9651	10745	11718	12507
11	5484	6665	7624	8502	9220
12	3353	4428	5287	6095	6759
13	6508	7535	8341	9110	9787
14	8592	10473	11902	13283	14485
15	5303	7202	8480	9798	10930
16	2124	2485	2734	2994	3214
17	1617	1694	1725	1747	1856
18	1328	1644	1821	2047	2242
19	801	965	1069	1173	1262
20	270	260	313	336	359
21	940	931	984	934	1029
22	187	134	58	2	-44
24	-845	-956	-1088	-1190	-1288
25	4466	7385	10105	12862	15477
26	-4049	-2914	-1940	-1135	-440

PLEASURE BOAT LOCKAGES					
LOCK	1980	1985	1990	1995	2000
51	991	993	974	964	962
52	959	944	941	930	925
1	3411	4740	5993	7088	7998
2	6288	9312	12206	14720	16437
3	7692	11209	14580	17550	20077
4	2697	3211	3702	4136	4604
5	2191	2204	2213	2235	2253
5A	2846	3169	3458	3722	3935
6	2443	2531	2838	3028	3183
7	3395	3866	4282	4648	4945
8	2100	2409	2681	2920	3113
9	2460	2758	3011	3240	3424
10	3299	3744	4122	4457	4730
11	2305	2713	3044	3347	3595
12	1570	1941	2237	2516	2746
13	2659	3013	3292	3557	3791
14	3378	4024	4521	4998	5413
15	2243	2898	3340	3795	4195
16	1147	1270	1356	1446	1522
17	971	997	1008	1033	1053
18	871	980	1041	1119	1186
19	689	745	781	817	848
20	506	502	520	524	536
21	737	734	752	735	768
22	477	450	432	413	397
24	121	82	37	2	-31
25	1954	2962	3901	4852	5755
26	-984	-594	-259	21	260

APPENDIX F

RECREATION USE FORECASTS
(And Other Related Data)

TABLE F-1

COUNTIES INCLUDED IN SCORP REGIONS
ALONG THE UPPER MISSISSIPPI RIVER

Minnesota		
<u>Region 7</u>	<u>Region 10</u>	<u>Region 11</u>
Benton	Dodge	Anoka
Chisago	Fillmore	Carver
Isanti	Freeborn	Dakota
Kanabec	Goodhue	Hennepin
Meeker	Houston	Ramsey
Mille Lacs	Mower	Scott
Pine	Olmsted	Washington
Sherburne	Steele	
Stearns	Wabasha	
Wright	Winona	

Wisconsin			
<u>Region 3</u>	<u>Region 4</u>	<u>Region 12</u>	<u>Region 13</u>
Grant	Crawford	Buffalo	Barron
Green	LaCrosse	Jackson	Dunn
Iowa	Monroe	Trempealeau	Pepin
LaFayette	Vernon		Pierce
Richland			Polk
Sauk			St. Croix

Iowa		
<u>Region 1</u>	<u>Region 2</u>	<u>Region 3</u>
Allamakee	Benton	Appanoose
Black Hawk	Iowa	Davis
Bremer	Johnson	Des Moines
Buchanan	Jones	Henry
Butler	Linn	Jefferson
Cedar	Muscatine	Keokuk
Chickasaw	Scott	Lee
Clayton	Washington	Louisa
Clinton		Lucas
Delaware		Mahaska
Dubuque		Monroe
Fayette		Van Buren
Grundy		Wapello
Howard		Wayne
Jackson		
Winneshiek		

TABLE F-1 (concluded)

Illinois			
Region 1A	Region 1B	Region 3A	Region 4
Boone	Bureau	Adams	Bond
Carroll	Fulton	Brown	Clinton
DeKalb	Hancock	Calhoun	Madison
Jo Daviess	Henderson	Cass	Monroe
Lee	Henry	Christian	Randolph
Ogle	Knox	Greene	St. Clair
Stephenson	LaSalle	Jersey	Washington
Whiteside	Marshall	Logan	
Winnebago	McDonough	Macoupin	
	Mercer	Mason	
	Peoria	Menard	
	Putnam	Montgomery	
	Rock Island	Morgan	
	Stark	Pike	
	Tazewell	Sangamon	
	Warren	Schuyler	
	Woodford	Scott	

Missouri			
Region 4	Region 5	Region 10	Region 11
Adair	Lewis	Lincoln	Franklin
Clark	Macon	Montgomery	Jefferson
Knox	Marion	Warren	St. Charles
Schuyler	Monroe		St. Louis
Scotland	Pike		St. Louis City
	Ralls		
	Randolph		
	Shelby		

TABLE F-2

RECREATION USE OF THE UPPER MISSISSIPPI RIVERZONE 1

<u>Pool</u>	<u>Year</u>	<u>Recreation Days of Use</u>	<u>Activity Use in Percent</u>			
			<u>Boating</u>	<u>Fishing</u>	<u>Swimming</u>	<u>Water Skiing</u>
U & L SAF	1972	43,300	75	30	10	5
	1973	41,200	75	30	10	5
	1974	52,700	75	30	5	5
	1975	78,500	60	10	5	5
	1976	82,500	60	10	5	5
	1977	79,800	60	10	5	5
	1977	79,800	60	10	5	5
1	1972	48,600	45	30	0	0
	1973	58,800	45	30	0	0
	1974	92,500	50	40	1	0
	1975	87,500	50	40	1	0
	1976	92,100	50	40	1	0
	1977	88,400	50	40	1	0
	1977	88,400	50	40	1	0
2	1972	228,300	70	25	0	10
	1973	267,600	70	25	0	10
	1974	284,700	70	25	0	10
	1975	303,500	70	10	0	10
	1976	318,700	70	10	0	10
	1977	304,100	70	10	0	10
	1977	304,100	70	10	0	10
3	1972	492,200	65	35	0	30
	1973	506,000	65	35	0	30
	1974	533,800	50	40	5	30
	1975	515,000	50	40	5	10
	1976	530,500	60	40	5	10
	1977	509,900	60	40	5	10
	1977	509,900	60	40	5	10
Totals	1972	812,400	64	30	2	11
	1973	873,600	64	30	2	11
	1974	963,700	61	29	3	11
	1975	984,500	58	25	3	6
	1976	1,023,800	60	25	3	6
	1977	982,200	60	25	3	6

Percent of Total Increase 1972-1977 is 20.9

Source: U.S. Army, Corps of Engineers(RRMS).

TABLE F-2 (continued)

ZONE 2

<u>Pool</u>	<u>Year</u>	<u>Recreation Days of Use</u>	<u>Activity Use in Percent</u>			
			<u>Boating</u>	<u>Fishing</u>	<u>Swimming</u>	<u>Water Skiing</u>
4	1972	460,400	75	30	10	35
	1973	456,600	75	30	10	35
	1974	540,900	75	40	15	35
	1975	538,600	75	40	15	35
	1976	554,600	75	25	10	20
	1977	530,700	75	25	10	20
5	1972	63,000	70	45	7	11
	1973	61,500	70	45	7	11
	1974	174,200	70	45	5	15
	1975	181,100	70	45	5	15
	1976	190,400	50	10	5	25
	1977	186,400	50	10	5	25
5A	1972	240,400	65	30	10	15
	1973	230,200	65	30	10	15
	1974	241,200	65	40	10	10
	1975	244,300	65	40	10	10
	1976	256,700	65	40	10	10
	1977	246,700	65	40	10	10
6	1972	488,700	60	72	10	22
	1973	519,800	60	72	10	22
	1974	530,400	75	72	10	25
	1975	544,500	75	75	10	10
	1976	560,500	60	20	10	20
	1977	538,500	60	20	10	20
7	1972	308,800	20	65	8	15
	1973	319,200	20	65	8	15
	1974	311,900	70	60	10	15
	1975	316,700	70	60	10	10
	1976	333,000	60	20	15	20
	1977	321,400	60	20	15	20
8	1972	407,500	35	66	10	15
	1973	432,200	35	66	10	15
	1974	429,700	40	70	10	15
	1975	455,700	50	60	10	10
	1976	478,700	50	25	5	10
	1977	464,400	50	25	5	10
9	1972	438,600	35	67	8	15
	1973	438,100	35	67	8	15
	1974	438,700	55	70	8	15
	1975	482,800	55	60	10	10
	1976	498,200	50	20	5	5
	1977	474,400	50	20	5	5
Totals	1972	2,407,400	51	54	9	18
	1973	2,457,600	51	54	9	18
	1974	2,667,000	64	57	10	19
	1975	2,763,700	66	54	10	14
	1976	2,872,100	59	23	9	16
	1977	2,762,500	59	23	9	16

Percent of Total Increase 1972-1977 is 14.8

Source: (see F-4).

TABLE F-2 (continued)

ZONE 3

<u>Pool</u>	<u>Year</u>	<u>Recreation Days of Use</u>	<u>Activity Use in Percent</u>			
			<u>Boating</u>	<u>Fishing</u>	<u>Swimming</u>	<u>Water Skiing</u>
10	1972	354,600	45	67	7	22
	1973	342,800	45	67	7	22
	1974	345,500	45	65	10	20
	1975	353,500	45	65	10	10
	1976	371,400	45	10	10	10
	1977	358,000	45	10	10	10
11	1972	335,000	15	33	11	1
	1973	445,700	15	36	10	1
	1974	521,000	15	36	12	1
	1975	640,000	55	52	30	5
	1976	642,800	30	50	2	2
	1977	1,600,700	37	36	2	2
12	1972	563,600	15	33	11	1
	1973	574,100	16	33	10	2
	1974	712,700	16	33	10	2
	1975	922,000	30	55	10	3
	1976	1,392,400	30	50	2	2
	1977	1,272,000	39	32	2	2
13	1972	1,112,000	15	33	11	1
	1973	2,646,200	15	33	11	1
	1974	2,690,300	15	33	11	1
	1975	3,215,700	25	45	12	1
	1976	3,025,600	30	50	2	2
	1977	1,413,600	31	33	1	2
Totals	1972	2,365,200	22	42	10	6
	1973	4,008,800	23	42	10	6
	1974	4,269,500	23	42	11	6
	1975	5,131,200	39	54	16	5
	1976	5,432,200	34	40	4	4
	1977	4,644,300	38	28	4	4

Percent of Total Increase 1972-1977 is 96.4.

Source: (see F-4).

TABLE F-2 (continued)

ZONE 4

<u>Pool</u>	<u>Year</u>	<u>Recreation Days of Use</u>	<u>Activity Use in Percent</u>			
			<u>Boating</u>	<u>Fishing</u>	<u>Swimming</u>	<u>Water Skiing</u>
14	1972	687,200	15	33	11	1
	1973	475,100	18	33	2	1
	1974	887,200	18	33	2	1
	1975	909,200	20	35	2	1
	1976	749,900	30	50	2	2
	1977	2,316,400	36	39	2	3
15	1972	419,400	35	51	1	13
	1973	646,500	37	52	1	14
	1974	589,500	37	52	1	14
	1975	798,600	45	60	2	20
	1976	419,000	30	50	2	2
	1977	2,102,700	41	31	1	4
16	1972	1,117,300	12	29	8	6
	1973	2,644,000	14	39	8	6
	1974	1,768,000	14	29	6	6
	1975	2,043,000	30	40	10	11
	1976	1,153,200	30	50	2	2
	1977	2,470,300	32	37	2	4
17	1972	784,800	10	33	1	1
	1973	642,500	10	38	1	2
	1974	382,600	10	38	1	2
	1975	617,200	15	38	2	3
	1976	653,400	30	50	2	2
	1977	1,159,400	30	39	2	2
18	1972	508,000	12	23	16	2
	1973	868,300	15	41	17	3
	1974	876,900	15	41	17	3
	1975	890,700	20	42	18	3
	1976	735,800	30	50	2	2
	1977	1,630,900	29	40	3	2
19	1972	196,100	12	23	16	2
	1973	2,707,600	14	28	18	3
	1974	3,059,000	14	28	18	3
	1975	3,111,000	20	30	19	4
	1976	1,855,400	30	50	2	2
	1977	2,623,300	31	36	4	4
Totals	1972	3,712,800	16	32	9	4
	1973	7,984,000	18	38	8	5
	1974	7,563,200	18	37	8	5
	1975	8,369,700	25	41	9	7
	1976	5,566,700	30	50	2	2
	1977	12,303,000	33	37	2	3

Percent of Total Increase 1972-1977 is 231.4.

Source: (see F-4).

TABLE F-2 (continued)

ZONE 5

<u>Pool</u>	<u>Year</u>	<u>Recreation Days of Use</u>	<u>Activity Use in Percent</u>			
			<u>Boating</u>	<u>Fishing</u>	<u>Swimming</u>	<u>Water Skiing</u>
20	1972	124,400	1	68	1	1
	1973	180,700	2	69	1	1
	1974	206,400	3	69	1	1
	1975	208,800	4	71	2	2
	1976	145,200	30	50	2	2
	1977	259,900	30	37	2	3
21	1972	488,100	1	68	1	1
	1973	2,069,400	5	39	1	1
	1974	4,208,700	5	39	1	1
	1975	4,239,600	20	50	2	2
	1976	2,418,100	30	50	2	2
	1977	2,177,100	33	30	3	3
22	1972	237,200	1	17	1	1
	1973	237,200	1	17	1	1
	1974	570,500	30	17	2	5
	1975	610,500	40	20	5	10
	1976	1,112,700	30	50	2	2
	1977	1,528,200	28	33	6	3
24	1972	406,800	75	30	5	15
	1973	256,400	25	30	5	1
	1974	541,700	30	32	4	3
	1975	454,600	30	32	4	3
	1976	502,400	21	35	26	9
	1977	504,019	21	35	26	9
25	1972	867,900	75	40	10	20
	1973	494,800	30	30	5	1
	1974	1,020,100	30	35	4	3
	1975	390,100	30	35	4	3
	1976	1,396,300	21	35	26	9
	1977	1,400,725	21	35	26	9
Totals	1972	2,124,400	31	45	4	8
	1973	3,238,500	13	37	3	1
	1974	6,547,400	20	38	2	3
	1975	5,903,600	25	42	3	4
	1976	5,574,700	26	44	12	5
	1977	5,869,944	27	34	13	5

Percent of Total Increase 1972-1977 is 176.3

Source: (see F-4).

TABLE F-2 (concluded)

ZONE 6

<u>Pool</u>	<u>Year</u>	<u>Recreation Days of Use</u>	<u>Activity Use in Percent</u>			
			<u>Boating</u>	<u>Fishing</u>	<u>Swimming</u>	<u>Water Skiing</u>
26	1972	2,718,900	70	30	35	25
	1973	1,548,900	50	35	10	2
	1974	3,121,100	33	36	4	3
	1975	4,059,500	33	36	4	3
	1976	3,939,200	21	35	6	9
	1977	3,951,781	21	35	26	9

Percent of Total Increase 1972-1977 is 45.3

Source: (see F-4).

TABLE F-3

POPULATION PROJECTIONS FOR APPROPRIATE AGE GROUP*
BY SCORP REGIONS AND USE ZONES ALONG THE UPPER MISSISSIPPI RIVER

SCORP REGION	1980	1985	1990	1995	2000
<u>Zone 1</u>					
Minnesota 7	289,600	316,500	348,000	379,500	415,400
Minnesota 11	1,827,000	1,905,700	2,003,500	2,093,300	2,161,900
Wisconsin 13	166,500	176,600	199,900	218,800	236,600
TOTAL	2,283,100	2,398,800	2,551,400	2,691,600	2,813,900
<u>Zone 2</u>					
Minnesota 10	332,700	344,400	357,000	370,400	378,900
Wisconsin 4	145,400	150,800	157,000	162,800	166,700
Wisconsin 12	49,700	51,500	53,700	55,800	57,300
TOTAL	527,800	546,700	567,700	589,000	602,900
<u>Zone 3</u>					
Iowa 1	445,400	459,100	471,400	486,900	504,600
Wisconsin 3	161,000	168,000	176,800	185,600	192,300
Illinois 1A	571,900	607,400	649,000	697,700	756,400
TOTAL	1,178,300	1,234,500	1,297,200	1,370,200	1,453,300
<u>Zone 4</u>					
Iowa 2	425,100	444,900	461,400	477,700	494,700
Iowa 3	216,400	215,200	214,600	215,600	217,700
Illinois 1B	979,100	1,015,100	1,054,700	1,105,800	1,179,000
TOTAL	1,620,600	1,675,200	1,730,700	1,799,100	1,891,400
<u>Zone 5</u>					
Missouri 4	44,900	46,500	48,000	50,000	51,900
Missouri 5	111,800	115,300	119,000	123,100	127,400
Missouri 10	43,000	49,500	56,000	65,100	74,300
Illinois 3A	532,700	545,600	571,100	592,800	636,500
TOTAL	732,400	756,900	794,100	831,000	890,100
<u>Zone 6</u>					
Missouri 11	1,597,100	1,625,100	1,653,200	1,719,600	1,786,300
Illinois 4	652,200	653,400	685,600	720,400	750,300
TOTAL	2,249,300	2,278,500	2,338,800	2,440,000	2,536,600

* Minnesota--6 years and over Source: Illinois--Bureau of the Budget (1977)
 Wisconsin--6 years and over Iowa--Office for Planning and Programm-
 Iowa--12 years and over ing (Series I-76, No. 2)
 Illinois--All age groups Minnesota--Office of the State Demographer,
 Missouri--6 years and over November 1975
 Missouri--Office of Administration,
 November 10, 1976
 Wisconsin--Department of Administration June
 1975

TABLE F-4

POPULATION GROWTH TRENDS

<u>State and Region</u>	<u>Percent Change from 1980</u>			
	<u>1985</u>	<u>1990</u>	<u>1995</u>	<u>2000</u>
<u>Illinois:</u>				
All Population				
Region 1A	6.2	13.5	22.0	32.3
Region 1B	3.7	7.7	12.9	20.4
Region 3A	2.4	7.2	11.3	19.5
Region 4	0.2	5.1	10.5	15.0
Total Change	3.1	8.2	13.9	21.4
<u>Minnesota:</u>				
6 Years and Over				
Region 7	9.3	20.2	31.0	43.4
Region 10	3.5	7.3	11.3	13.9
Region 11	4.3	9.7	14.6	18.3
Total Change	4.8	10.6	16.1	20.7
<u>Wisconsin:</u>				
6 Year and Over				
Region 3	4.3	9.8	15.3	19.4
Region 4	3.7	8.0	12.0	14.6
Region 12	3.6	8.0	12.3	15.3
Region 13	6.1	20.1	31.4	42.1
Total Change	4.6	12.4	19.2	24.9
<u>Iowa:</u>				
12 Years and Over				
Region 1	3.1	5.8	9.3	13.3
Region 2	4.7	8.5	12.4	16.4
Region 3	-0.6	-0.8	-0.4	0.6
Total Change	3.0	5.6	8.6	12.0
<u>Missouri:</u>				
6 Years and Over				
Region 4	3.6	6.9	11.4	15.6
Region 5	3.1	6.4	10.1	14.0
Region 10	15.1	30.2	51.4	72.8
Region 11	1.8	3.5	7.7	11.8
Total Change	2.2	4.4	9.0	13.5

TABLE F-5

PER CAPITA PARTICIPATION RATES BY SCORP REGIONS
ALONG THE UPPER MISSISSIPPI RIVER
 (Figures in Parenthesis Reflect A Base Year Rate: 1970 = 100)

Minnesota				
Activity	Region 7	Region 10	Region 11	
Boating (excluding canoeing, sailing)	8.13 (9.03)	7.72 (8.58)	9.37 (10.41)	
Fishing, warm/cold water	8.08 (8.33)	6.11 (6.30)	8.48 (8.74)	
Swimming	20.11 (22.34)	23.93 (26.59)	26.39 (29.32)	
Water Skiing	2.15 (2.69)	2.57 (3.21)	2.35 (2.94)	
Canoeing	0.82 (1.02)	0.61 (0.75)	0.66 (1.08)	

Source: Minnesota Outdoor Recreation Plan--1968 based on 1966-1967 data.

Wisconsin				
Activity	Region 3	Region 4	Region 12	Region 13
Boating (excluding canoeing, sailing)	4.12	4.12	4.12	4.12
Fishing, fresh water (warm/cold)	6.51	6.51	6.51	6.51
Swimming	14.58	14.58	14.58	14.58
Water Skiing	1.23	1.23	1.23	1.23
Canoeing	0.38	0.38	0.38	0.38

Source: "Opportunities in the Leisure Industry," Vol. 2, Statistical Summary 1970; Rates used were for the North Central Region of the U.S.

Iowa				
Activity	Region 1	Region 2	Region 3	
Boating (powerboating, water skiing, and other boating)	4.96 (4.13)	4.90 (4.08)	4.83 (4.02)	
Fishing	8.09 (7.35)	7.25 (6.59)	9.13 (8.30)	
Swimming, other (pools excluded)	2.45 (2.04)	4.01 (3.34)	3.56 (2.97)	
Water Skiing (1970 L/R N. Central Region rate)	1.23 (same)	1.23 (same)	1.23 (same)	
Canoeing, Kayak	1.10 (0.81)	0.65 (0.48)	0.61 (0.45)	

Source: Statewide Summary Tables, SCORP 1975.

TABLE F-5 (concluded)

Illinois				
Activity	Region 1A	Region 1B	Region 3A	Region 4
Boating (10 hp or less, greater than 10 hp)	4.86 (4.05)	3.25 (2.71)	2.51 (2.09)	5.78 (4.32)
Fishing (rate from 1970 state plan)	5.36 (same)	5.91 (same)	5.34 (same)	5.85 (same)
Swimming (beach swimming other than @ Lake Mich. no pool use)	5.35 (4.46)	3.80 (3.17)	3.25 (2.71)	5.45 (4.54)
Water Skiing (rate from 1970 State plan)	0.44 (same)	0.43 (same)	0.44 (same)	0.43 (same)
Canoeing, rivers and streams, lakes and ponds	2.05 (1.52)	1.02 (0.75)	1.42 (1.05)	0.74 (0.55)

Source: 1976 Illinois SCORP draft, June 1977.

Missouri				
Activity	Region 4	Region 5	Region 10	Region 11
Boating	3.86 (3.45)	5.06 (4.52)	3.62 (3.23)	2.12 (1.89)
Fishing (cold/warm)	15.04 (14.60)	11.49 (11.16)	5.07 (4.92)	5.05 (4.90)
Swimming, lake pool excluded	6.92 (6.18)	3.44 (7.54)	2.99 (2.67)	4.16 (3.71)
Water Skiing	2.10 (1.74)	0.92 (0.76)	1.05 (0.87)	0.58 (0.48)
Canoeing, floating	3.31 (2.74)	2.73 (2.26)	0.43 (0.36)	0.80 (0.66)

Source: 1973 Missouri SCORP Demand Update.

TABLE F-6

FORECAST OF PARTICIPATION RATES BY SCORP REGION
AND USE ZONE ALONG THE UPPER MISSISSIPPI RIVER

ZONE 1

Activity	Per Capita Participation Rate				
	1980	1985	1990	1995	2000
Minnesota 7:					
Boating	12.64	14.90	17.16	19.41	21.67
Fishing	9.16	9.58	10.00	10.41	10.83
Swimming	31.28	36.86	42.45	48.03	53.62
Water Skiing	4.57	5.78	6.99	8.20	9.42
Canoeing	1.73	2.19	2.65	3.11	3.57
Minnesota 11:					
Boating	14.57	17.18	19.78	22.38	24.98
Fishing	9.61	10.05	10.49	10.92	11.36
Swimming	41.05	48.38	55.71	63.04	70.37
Water Skiing	5.00	6.32	7.64	8.97	10.29
Canoeing	1.84	2.32	2.81	3.29	3.78
Wisconsin 13:					
Boating	5.77	6.80	7.83	8.86	9.89
Fishing	7.16	7.49	7.81	8.14	8.46
Swimming	20.41	24.06	27.70	31.35	34.99
Water Skiing	2.09	2.64	3.20	3.75	4.30
Canoeing	0.65	0.82	0.99	1.16	1.33

TABLE F-6 (continued)

ZONE 2

Activity	Per Capita Participation Rate				
	1980	1985	1990	1995	2000
Minnesota 10:					
Boating	12.01	14.16	16.30	18.45	20.59
Fishing	6.93	7.24	7.56	7.88	8.19
Swimming	37.23	43.87	50.52	57.17	63.82
Water Skiing	5.46	6.90	8.35	9.79	11.24
Canoeing	1.29	1.63	1.98	2.32	2.66
Wisconsin 4:					
Boating	5.77	6.80	7.83	8.86	9.89
Fishing	7.16	7.49	7.81	8.14	8.46
Swimming	20.41	24.06	27.70	31.35	34.99
Water Skiing	2.09	2.64	3.20	3.75	4.30
Canoeing	0.65	0.82	0.99	1.16	1.33
Wisconsin 12:					
Boating	5.77	6.80	7.83	8.86	9.89
Fishing	7.16	7.49	7.81	8.14	8.46
Swimming	20.41	24.06	27.70	31.35	34.99
Water Skiing	2.09	2.64	3.20	3.75	4.30
Canoeing	0.65	0.82	0.99	1.16	1.33

TABLE F-6 (continued)

ZONE 3

<u>Activity</u>	<u>Per Capita Participation Rate</u>				
	<u>1980</u>	<u>1985</u>	<u>1990</u>	<u>1995</u>	<u>2000</u>
Iowa 1:					
Boating	5.78	6.81	7.85	8.88	9.91
Fishing	8.08	8.45	8.82	9.19	9.56
Swimming	2.86	3.37	3.88	4.39	4.90
Water Skiing	2.09	2.64	3.20	3.75	4.30
Canoeing	1.38	1.74	2.11	2.47	2.84
Wisconsin 3:					
Boating	5.77	6.80	7.83	8.86	9.89
Fishing	7.16	7.49	7.81	8.14	8.46
Swimming	20.41	24.06	27.70	31.35	34.99
Water Skiing	2.09	2.64	3.20	3.75	4.30
Canoeing	0.65	0.82	0.99	1.16	1.33
Illinois 1A:					
Boating	5.67	6.68	7.70	8.71	9.72
Fishing	6.56	6.85	7.15	7.45	7.75
Swimming	6.24	7.36	8.47	9.59	10.70
Water Skiing	0.75	0.95	1.14	1.34	1.54
Canoeing	2.58	3.27	3.95	4.64	5.32

TABLE F-6 (continued)

ZONE 4

<u>Activity</u>	<u>Per Capita Participation Rate</u>				
	<u>1980</u>	<u>1985</u>	<u>1990</u>	<u>1995</u>	<u>2000</u>
Iowa 2:					
Boating	5.71	6.73	7.75	8.77	9.79
Fishing	7.25	7.58	7.91	8.24	8.57
Swimming	4.68	5.51	6.35	7.18	8.02
Water Skiing	2.09	2.64	3.20	3.75	4.30
Canoeing	0.82	1.03	1.25	1.46	1.68
Iowa 3:					
Boating	5.63	6.63	7.64	8.64	9.65
Fishing	9.13	9.54	9.96	10.38	10.79
Swimming	4.16	4.90	5.64	6.39	7.13
Water Skiing	2.09	2.64	3.20	3.75	4.30
Canoeing	0.76	0.97	1.17	1.37	1.58
Illinois 1B:					
Boating	3.79	4.47	5.15	5.83	6.50
Fishing	6.50	6.80	7.09	7.39	7.68
Swimming	4.44	5.23	6.02	6.82	7.61
Water Skiing	0.73	0.92	1.12	1.31	1.50
Canoeing	1.28	1.61	1.95	2.29	2.62

TABLE F-6 (continued)

ZONE 5

<u>Activity</u>	<u>Per Capita Participation Rate</u>				
	<u>1980</u>	<u>1985</u>	<u>1990</u>	<u>1995</u>	<u>2000</u>
Missouri 4:					
Boating	4.83	5.69	6.56	7.42	8.28
Fishing	16.06	16.79	17.52	18.25	18.98
Swimming	8.65	10.20	11.74	13.29	14.83
Water Skiing	2.96	3.74	4.52	5.31	6.09
Canoeing	4.66	5.89	7.12	8.36	9.59
Missouri 5:					
Boating	6.33	7.46	8.59	9.72	10.85
Fishing	12.28	12.83	13.39	13.95	14.51
Swimming	10.56	12.44	14.33	16.21	18.10
Water Skiing	1.29	1.63	1.98	2.32	2.66
Canoeing	3.84	4.86	5.88	6.89	7.91
Missouri 10:					
Boating	4.52	5.33	6.14	6.94	7.75
Fishing	5.41	5.66	5.90	6.15	6.40
Swimming	3.74	4.41	5.07	5.74	6.41
Water Skiing	1.48	1.87	2.26	2.65	3.04
Canoeing	0.61	0.77	0.94	1.10	1.26
Illinois 3A:					
Boating	2.93	3.45	3.97	4.49	5.01
Fishing	6.53	6.83	7.13	7.42	7.72
Swimming	3.79	4.47	5.15	5.83	6.50
Water Skiing	0.75	0.95	1.14	1.34	1.54
Canoeing	1.78	2.26	2.73	3.20	3.68

TABLE F-6 (concluded)

ZONE 6

<u>Activity</u>	<u>Per Capita Participation Rate</u>				
	<u>1980</u>	<u>1985</u>	<u>1990</u>	<u>1995</u>	<u>2000</u>
Missouri 11:					
Boating	2.65	3.12	3.59	4.06	4.54
Fishing	5.39	5.64	5.88	6.12	6.37
Swimming	5.19	6.12	7.05	7.98	8.90
Water Skiing	0.82	1.03	1.25	1.46	1.68
Canoeing	1.12	1.42	1.72	2.01	2.31
Illinois 4:					
Boating	6.75	7.95	9.16	10.36	11.57
Fishing	6.44	6.73	7.02	7.31	7.60
Swimming	6.36	7.49	8.63	9.76	10.90
Water Skiing	0.73	0.92	1.12	1.31	1.50
Canoeing	0.94	1.18	1.43	1.68	1.92

TABLE F-7

FORECAST OF RECREATION DAYS BY SCORP REGION
AND USE ZONE ALONG THE UPPER MISSISSIPPI RIVER

ZONE 1

Activity	Recreation Days				
	1980	1985	1990	1995	2000
Minnesota 7:					
Boating	3,660,500	4,715,800	5,971,700	7,366,100	9,001,700
Fishing	2,652,700	3,032,100	3,480,000	3,950,600	4,498,800
Swimming	9,058,700	11,666,200	14,772,600	18,227,400	22,273,700
Water Skiing	1,323,500	1,829,400	2,432,500	3,111,900	3,913,100
Canoeing	501,000	693,100	922,200	1,180,200	1,483,000
Minnesota 11:					
Boating	26,619,400	32,739,900	39,629,200	46,848,100	54,004,300
Fishing	17,557,500	19,152,300	21,016,700	22,858,800	24,559,200
Swimming	74,998,400	92,197,800	111,615,000	131,361,600	152,132,900
Water Skiing	9,135,000	12,044,000	15,306,700	18,776,900	22,246,000
Canoeing	3,361,700	4,421,200	5,629,800	6,887,000	8,172,000
Wisconsin 13:					
Boating	960,700	1,200,900	1,565,200	1,938,600	2,340,000
Fishing	1,192,100	1,322,700	1,561,200	1,781,000	2,001,600
Swimming	3,398,300	4,249,000	5,537,200	6,859,400	8,278,600
Water Skiing	348,000	466,200	639,700	820,500	1,017,400
Canoeing	108,200	144,800	197,900	253,800	314,700
Zone 1 Totals:					
Boating	31,240,600	38,656,600	47,166,100	56,152,800	65,346,000
Fishing	21,402,300	23,507,100	26,057,900	28,590,400	31,059,600
Swimming	87,455,400	108,113,000	131,324,800	157,048,400	182,685,200
Water Skiing	10,806,500	14,339,600	18,378,900	22,709,300	27,176,500
Canoeing	3,970,900	5,259,100	6,749,900	8,321,000	9,969,700

TABLE F-7 (continued)

ZONE 2

Activity	Recreation Days				
	1980	1985	1990	1995	2000
Minnesota 10:					
Boating	3,995,700	4,876,700	5,819,100	6,833,900	7,301,600
Fishing	2,305,500	2,493,500	2,598,900	2,918,800	3,103,200
Swimming	12,386,400	15,108,800	18,035,600	21,183,200	24,181,400
Water Skiing	1,816,500	2,376,400	2,981,000	3,626,200	4,258,300
Canoeing	429,200	561,400	706,900	859,300	1,007,900
Wisconsin 4:					
Boating	839,000	1,025,400	1,229,300	1,442,400	1,648,700
Fishing	1,041,100	1,129,500	1,226,200	1,325,200	1,410,300
Swimming	2,367,600	3,628,200	4,348,900	5,103,800	5,832,800
Water Skiing	303,900	398,100	502,400	610,500	716,800
Canoeing	94,500	123,700	155,400	188,800	221,700
Wisconsin 12:					
Boating	286,800	350,200	420,500	494,400	566,700
Fishing	355,900	385,700	419,400	454,200	484,800
Swimming	1,014,400	1,239,100	1,487,500	1,749,300	2,004,900
Water Skiing	103,900	136,000	171,800	209,200	246,400
Canoeing	32,300	42,200	53,200	64,700	76,200
Zone 2 Totals:					
Boating	5,121,500	6,252,300	7,468,900	8,770,700	10,017,000
Fishing	3,702,600	4,008,700	4,344,500	4,698,200	4,998,300
Swimming	16,368,400	19,976,100	23,872,000	28,036,300	32,019,100
Water Skiing	2,224,300	2,910,500	3,655,200	4,445,900	5,222,000
Canoeing	556,000	727,300	915,500	1,112,800	1,305,800

TABLE F-7 (continued)

ZONE 3

Activity	Recreation Days				
	1980	1985	1990	1995	2000
Iowa 1:					
Boating	2,574,400	3,126,500	3,700,500	4,323,700	5,000,600
Fishing	3,598,800	3,879,400	4,157,700	4,474,500	4,824,000
Swimming	1,273,800	1,547,200	1,829,000	2,137,500	2,472,500
Water Skiing	930,900	1,212,000	1,508,500	1,825,900	2,169,300
Canoeing	614,700	798,800	994,700	1,202,600	1,433,100
Wisconsin 3:					
Boating	929,000	1,142,400	1,384,300	1,644,400	1,901,800
Fishing	1,152,800	1,258,300	1,380,800	1,510,800	1,626,900
Swimming	3,286,000	4,042,100	4,897,400	5,818,600	6,728,600
Water Skiing	336,500	443,500	565,800	696,000	826,300
Canoeing	104,600	137,800	175,000	215,300	255,800
Illinois 1A:					
Boating	3,242,700	4,057,400	4,997,300	6,077,000	7,352,200
Fishing	3,751,700	4,160,700	4,640,400	5,197,900	5,862,100
Swimming	3,568,700	4,470,500	5,497,000	6,690,300	8,093,500
Water Skiing	428,900	577,000	739,900	934,900	1,164,900
Canoeing	1,475,500	1,986,200	2,563,600	3,237,300	4,024,000
Zone 3 Totals:					
Boating	6,746,100	8,326,300	10,082,100	12,045,100	14,254,600
Fishing	8,503,300	9,298,400	10,178,900	11,183,300	12,313,000
Swimming	8,128,500	10,059,800	12,223,400	14,647,000	17,294,600
Water Skiing	1,696,300	2,232,500	2,814,200	3,456,800	4,161,600
Canoeing	2,194,800	2,922,800	3,733,300	4,655,200	5,712,300

TABLE F-7 (continued)

ZONE 4

Activity	Recreation Days				
	1980	1985	1990	1995	2000
Iowa 2:					
Boating	2,427,300	2,994,200	3,575,800	4,139,400	4,843,100
Fishing	3,082,000	3,372,300	3,649,700	3,936,200	4,239,600
Swimming	1,389,500	2,451,400	2,929,900	3,429,900	3,967,500
Water Skiing	888,500	1,174,500	1,476,500	1,791,400	2,127,200
Canoeing	348,600	458,200	576,800	697,400	831,100
Iowa 3:					
Boating	1,218,300	1,426,800	1,639,500	1,862,800	2,100,800
Fishing	1,975,700	2,053,000	2,137,400	2,237,900	2,349,000
Swimming	900,200	1,054,500	1,210,300	1,377,700	1,552,200
Water Skiing	452,300	568,100	686,700	808,500	936,100
Canoeing	164,500	208,700	251,100	295,400	344,000
Illinois 1B:					
Boating	3,710,800	4,537,500	5,431,700	6,446,800	7,563,500
Fishing	6,364,200	6,902,700	7,477,800	8,171,900	8,954,700
Swimming	4,347,200	5,309,000	6,349,300	7,541,600	8,972,200
Water Skiing	714,700	933,900	1,181,300	1,448,600	1,768,500
Canoeing	1,253,200	1,634,300	2,056,700	2,532,300	3,089,000
Zone 4 Totals:					
Boating	7,356,400	8,958,500	10,647,000	12,499,000	14,607,400
Fishing	11,421,900	12,328,000	13,264,900	14,346,000	15,643,300
Swimming	7,236,900	8,814,900	10,489,500	12,349,200	14,431,900
Water Skiing	2,055,500	2,676,500	3,344,500	4,048,500	4,831,800
Canoeing	1,766,300	2,301,200	2,884,600	3,525,100	4,264,100

TABLE F-7 (continued)

ZONE 5

<u>Activity</u>	<u>Recreation Days</u>				
	<u>1980</u>	<u>1985</u>	<u>1990</u>	<u>1995</u>	<u>2000</u>
Missouri 4:					
Boating	216,900	264,600	314,900	371,000	429,700
Fishing	721,100	780,700	841,000	912,500	985,100
Swimming	388,400	474,300	563,500	664,500	769,700
Water Skiing	132,900	173,900	217,000	265,500	316,100
Canoeing	209,200	273,900	341,800	418,000	497,700
Missouri 5:					
Boating	707,700	860,100	1,022,200	1,196,500	1,382,300
Fishing	1,372,900	1,479,300	1,593,400	1,717,200	1,848,600
Swimming	1,180,600	1,434,300	1,705,300	1,995,500	2,305,300
Water Skiing	144,200	187,900	235,600	285,600	338,900
Canoeing	429,300	560,400	699,700	848,200	1,007,700
Missouri 10:					
Boating	194,400	263,800	343,800	451,800	575,800
Fishing	232,600	280,200	330,400	400,400	475,500
Swimming	160,800	218,300	283,900	373,700	476,300
Water Skiing	63,600	92,600	126,600	172,500	225,900
Canoeing	26,200	38,100	52,600	71,600	93,600
Illinois 3A:					
Boating	1,560,800	1,882,300	2,267,300	2,661,700	3,188,900
Fishing	3,478,500	3,726,400	4,071,900	4,398,600	4,913,300
Swimming	2,018,900	2,438,800	2,941,200	3,456,000	4,137,200
Water Skiing	399,500	518,300	651,100	794,400	980,200
Canoeing	948,200	1,233,100	1,559,100	1,897,000	2,342,300
Zone 5 Totals:					
Boating	2,679,800	3,270,800	3,948,200	4,681,000	5,576,700
Fishing	5,805,100	6,266,600	6,836,700	7,428,700	8,223,000
Swimming	3,748,700	4,565,700	5,493,900	6,489,700	7,669,100
Water Skiing	740,200	972,700	1,230,300	1,518,000	1,861,100
Canoeing	1,612,900	2,105,500	2,653,200	3,234,800	3,941,300

TABLE F-7 (concluded)

ZONE 6

Activity	Recreation Days				
	1980	1985	1990	1995	2000
Missouri 11:					
Boating	4,232,300	5,070,300	5,935,000	6,981,600	8,109,300
Fishing	8,608,400	9,165,600	9,720,800	10,523,900	11,378,700
Swimming	8,288,900	9,945,600	11,655,100	13,722,400	15,898,100
Water Skiing	1,309,600	1,673,900	2,066,500	2,510,600	3,001,000
Canoeing	1,788,800	2,307,600	2,843,500	3,456,400	4,126,400
Illinois 4:					
Boating	4,402,400	5,194,500	6,280,100	7,463,300	8,681,000
Fishing	4,200,200	4,397,400	4,812,900	5,266,100	5,702,300
Swimming	4,148,000	4,894,000	5,916,700	7,031,100	8,178,300
Water Skiing	476,100	601,100	767,900	943,700	1,125,400
Canoeing	613,100	771,000	980,400	1,210,300	1,440,600
Zone 6 Totals:					
Boating	8,634,700	10,264,800	12,215,100	14,444,900	16,790,300
Fishing	12,808,600	13,563,000	14,533,700	15,790,000	17,081,000
Swimming	12,436,900	14,839,600	17,571,800	20,753,500	24,076,400
Water Skiing	1,785,700	2,275,000	2,834,400	3,454,300	4,126,400
Canoeing	2,401,900	3,078,600	3,823,900	4,666,700	5,567,000

APPENDIX G

SIMILAR PROJECT ANALYSIS OF RECREATION
USE ON UPPER MISSISSIPPI RIVER
(Program and Outputs)

METHODOLOGY

MRI modified the Corps similar "project concept," utilizing per capita use rates from the GREAT Recreation Demand Analysis, June 1976. First the per capita use rates for the 13 pools under the jurisdiction of the St. Paul District were analyzed and classified into three types of pools (urban river pools, rural river pools and lakes). The basis for this classification was primarily the resources in the pool and the type of per capita use rates generated at the 13 pools. Further classification would have resulted in little distinction between the classes because the per capita use rates varied little. Four pools were classified as urban river pools (including the Upper and Lower St. Anthony Falls, Pool 1 and Pool 2). Seven pools were classified as rural river pools (pools 3, 5, 5A, 6, 7, 8 and 10). The lake classification included two pools, 4 and 9 (see Table G-1).

These rates were assumed to be characteristic of all pools along the Upper Mississippi River. After discussion with the St. Paul District, it was concluded that pools 11 through 26 would all fall into the rural river classification. Thus, the appropriate per capita rates were utilized for these pools.

Using the same primary market area already identified in another part of this report and the distance matrix (distance between origin and destination areas) from the gravity model, the population for the three zones for 5 forecast years and each of the 28 pools were calculated by computer techniques (see the following computer program). The next step was to apply the appropriate activity per capita use rates to each of the population zones for the 5 forecast years to estimate total recreation activity in the seven activities for the 28 pools.

An internal computer subroutine provided for growth in the activity participation rates for each of the forecast years. These growth data were taken directly from MRI's COMPATRAX recreation participation allocation model. The total activity days are each pool were then converted to the number of visitor-days, using conversion factors developed from the GREAT I data. Another computer calculation provided an estimate of visitation from beyond the 75 mile zone. This factor was developed from the GREAT demand study. A final calculation aggregated the visitation data into the 28 pools for the 5 forecast years.

The computer program, various summary tables, coefficients and final outputs are located on the pages that follow.

TABLE G-1

CLASSIFICATION OF UPPER MISSISSIPPI RIVER POOLS
FOR SIMILAR PROJECT ANALYSIS

<u>Pool</u>	<u>Pool^{a/} Class</u>	<u>Output Number</u>
USAF	1	1
LSAF	1	2
1	1	3
2	1	4
3	3	5
4	2	6
5	3	7
5A	3	8
6	3	9
7	3	10
8	3	11
9	2	12
10	3	13
11	3	14
12	3	15
13	3	16
14	3	17
15	3	18
16	3	19
17	3	20
18	3	21
19	3	22
20	3	23
21	3	24
22	3	25
24	3	26
25	3	27
26	3	28

<u>a/</u>	<u>Pool Class</u>	<u>Code</u>
	River, Urban	1
	Lake	2
	River, Rural	3

COMPUTERIZED SIMILAR PROJECTS PROGRAM

```

PROGRAM HECRFA
C
C*** SFT UP DIMENSIONS, ARRAYS, ETC.
C
5  DIMENSION POP(162,5),RATES(3,3,7),ACTIVITY(28,7,5),GROWTH(7,5)
   DIMENSION POOLPOP(24,5,3),ICOUNTY(162),ISTATE(162),CONVERT(3),
   ITYPE(28)
10  DIMENSION EXPAND(3),TOTAL(28,5)
   INTEGER DIST(162,28)
C
C*** INITIALIZE ARRAYS
C
15  DO 10 I=1,28
     DO 10 J=1,5
     DO 10 K=1,3
16  POOLPOP(I,J,K)=0.0
     DO 12 I=1,28
     DO 12 J=1,7
     DO 12 K=1,5
20  ACTIVITY(I,J,K)=0.0
     DO 14 I=1,28
     DO 14 J=1,5
22  TOTAL(I,J)=0.0
C
C*** READ IN POPULATIONS(THOUSANDS)
C
25  WRITE(6,22)
26  FORMAT(1H,20X,30POPULATION DATA IN THOUSANDS OF PERSONS,/)
27  HEAD(5,25)ICOUNTY(1),ISTATE(1),POP(I,J),J=1,5)
28  FORMAT(10,10X,12,4X,5(16,1,4X))
29  WRITE(6,27)ICOUNTY(1),ISTATE(1),POP(1,J),J=1,5)
30  FORMAT(1H,13,2X,10,3X,12,5(5X,7,1))
31  CONTINUE
C
C*** READ IN DISTANCES FROM POPULATIONS TO POOLS
C
35  WRITE(6,33)
36  DO 30 I=1,162
37  READ(5,31) (DIST(I,J),J=1,28)
38  FORMAT(10X,14(2X,13)/10X,14(2X,13))
39  WRITE(6,32)I,(DIST(I,J),J=1,28)
40  FORMAT(1H,14,4X,28(1X,13))
41  CONTINUE
C
C*** DETERMINE WHETHER OR NOT POOL RECEIVES ANY POPULATION FROM COUNTY
C IF SO, ADD POPULATION TO CORRECT DISTANCE RAND
C
45  DO 40 I=1,162
46  DO 40 J=1,28
47  IF (DIST(I,J).GT=.25) GO TO 34
48  POOLPOP(J,K,1)=POOLPOP(J,K,1) + POP(I,K)
49  CONTINUE

```

```

60      GO TO 40
34      IF (INDIST(I,J) .GT. 50) GO TO 37
      DO 36 K=1,5
      POOLPOP(J,K,2)=POOLPOP(J,K,2) + POP(I,K)
36      CONTINUE
37      IF (INDIST(I,J) .GT. 75) GO TO 40
      DO 38 K=1,5
      POOLPOP(J,K,3)=POOLPOP(J,K,3) + POP(I,K)
38      CONTINUE
39      CONTINUE
40      CONTINUE
C
C----- PRINT TABLE OF POPULATIONS (POOL X ZONE X YEAR)
C
70      DO 45 J=1,5
      WRITE (6,A1)
41      FORMAT(1H1,44HALLOCATED POPULATION BY POOL, ZONE, AND YEAR)
      WRITE (6,A2) J
42      FORMAT(1H0,44YEAR,13,/)
75      DO 44 I=1,28
      WRITE (6,A3) I, (POOLPOP(I,J,K), K=1,3)
43      FORMAT(1H1,44POOL,13,4X,3F12.1,4X)
44      CONTINUE
45      CONTINUE
80      C----- READ IN POOL TYPE
C
      READ (5,51) TYPE
51      FORMAT(2I(1),1X)
85      C
C----- APPLY ACTIVITY RATES TO EACH DISTANCE-ZONE POPULATION
C
C----- FIRST READ IN ACTIVITY RATES
C
90      DO 55 I=1,3
      DO 55 J=1,3
      READ (5,54) RATES(I,J,K), K=1,7)
54      FORMAT(7F5.0,5X)
55      CONTINUE
95      C
C----- THEN COMPUTE ACTIVITY LEVELS
C
      DO 60 I=1,28
      L=TYPE(I)
      DO 60 J=1,7
      DO 58 K=1,5
      DO 58 M=1,3
      ACTIVITY(I,J,K)=ACTIVITY(I,J,K) + RATES(L,M,J)*POOLPOP(I,K,M)
58      CONTINUE
60      CONTINUE
105      C
C----- PRINT ACTIVITIES BY POOL BY YEAR
C
      DO 70 I=1,5
      WRITE (6,A1) I

```

```

61 FORMAT(1H1,51HRECREATIONAL ACTIVITIES - POOLS BY ACTIVITY BY YEAR,
1 //,5H YEAR,13)
DO 48 J=1,28
WRITE(6,6P2) J,ACTIVITY(I,J),K=1,7)
62 FORMAT(1H0,4HP00L,13.7(1X,F10.2))
68 CONTINUE
70 CONTINUE
C
C**** APPLY GROWTH FACTORS
C
DO 75 I=1,7
READ(5,71)(GROWTH(I,J),J=1,5)
71 FORMAT(5F5.2,5X)
75 CONTINUE
DO 77 I=1,7
DO 77 J=1,5
X=GROWTH(I,J)
DO 76 K=1,28
ACTIVITY(K,I,J)=ACTIVITY(K,I,J)*X
76 CONTINUE
77 CONTINUE
DO 80 I=1,5
WRITE(6,78) I
78 FORMAT(1H1,51H GROWTH RATES APPLIED TO POOLS BY ACTIVITIES BY YEAR,
1 //,5H YEAR,13)
DO 79 J=1,28
WRITE(6,81) J,ACTIVITY(J,K,I),K=1,7)
81 FORMAT(1H0,4HP00L,13.7(1X,F10.2))
79 CONTINUE
80 CONTINUE
C
C**** APPLY CONVERSION FACTORS
C
READ(5,82)(CONVERT(I),I=1,3)
82 FORMAT(3F5.0,3X)
DO 85 I=1,28
L=TYPE(I)
DO 84 J=1,7
DO 84 K=1,5
ACTIVITY(I,J,K)=ACTIVITY(I,J,K)*CONVERT(L)
84 CONTINUE
85 CONTINUE
DO 90 K=1,5
WRITE(6,86) K
86 FORMAT(1H1,63H CONVERSION RATES TO VISITOR DA S BY POOL S BY ACTIVITY
1 BY YEAR, //,5H YEAR,13)
DO 89 I=1,28
WRITE(6,87) I,ACTIVITY(I,J,K),J=1,7)
87 FORMAT(1H,4HP00L,13.7(1X,F10.2))
89 CONTINUE
90 CONTINUE
C
C**** APPLY EXPANSION FACTOR
C
READ(5,92)(EXPAN(I),I=1,3)

```

PROGRAM HFCKFA

12 FORMAT(15F5.0,5X1)

DO 95 J=1,24

L=TYPE(I)

DO 94 J=1,7

DO 94 K=1,5

ACTIVITY(I,J,K)=ACTIVITY(I,J,K)*EXPAND(L)

94 CONTINUE

95 CONTINUE

DO 100 M=1,5

WRITE(6,96)M

96 FORMAT(1M1,74HEXPANDED VISITOR DAYS FOR MORE DISTANT ORIGINS BY PO

101 BY ACTIVITY BY YEAR,5H YEAR,I3)

DO 99 J=1,24

WRITE(6,97)J,ACTIVITY(I,J,K),J=1,7

97 FORMAT(1M0,4HP00L,13,7(3X,F10,2))

99 CONTINUE

100 CONTINUE

C
C*** COMBINE AND PRINT TABLE FOR ALL VISITS BY POOL BY YEAR

DO 120 I=1,24

DO 120 K=1,5

DO 120 J=1,7

TOTAL(I,J,K)=TOTAL(I,J,K) + ACTIVITY(I,J,K)

120 CONTINUE

WRITE(6,130)

130 FORMAT(1M1,20X,12HTOTAL VISITS,/,20X, 64H1980 1985

1 1990 1995 2000,20X,64H----

2-- ---- ---- ----

DO 140 I=1,24

WRITE(6,135)I,12HTOTAL(I,J,K),J=1,5

135 FORMAT(1M0,4HP00L,13,5X,5(F12,2,3X))

140 CONTINUE

STOP

END

POPULATION DATA (1980, 1985, 1990, 1995, 2000)
AND
GRAVITY MODEL DISTANCE MATRIX

POPULATION DATA IN THOUSANDS OF PERSONS

1	ADAMS	17	67.1	68.9	69.2	72.4	81.5
2	HOND	17	15.4	15.7	15.9	16.5	16.8
3	ROONE	17	26.1	28.8	31.6	36.7	38.0
4	BROWN	17	5.1	5.0	4.8	4.8	5.2
5	HURFALL	17	37.4	38.2	39.7	41.5	43.0
6	CALHOUN	17	5.4	5.4	5.3	5.3	5.3
7	CARROLL	17	19.4	19.7	20.1	20.9	22.0
8	CASS	17	13.5	13.9	14.4	14.8	15.6
9	CHRISTIAN	17	36.5	37.0	37.8	38.3	39.0
10	CLINTON	17	30.2	30.6	31.3	31.6	31.9
11	DE KALB	17	64.1	75.5	83.6	93.6	106.6
12	FAYETTE	17	20.5	21.5	22.7	23.3	23.4
13	FULTON	17	42.5	42.9	44.4	47.5	51.7
14	GREENE	17	16.2	16.0	16.1	16.0	16.0
15	HAMCOCK	17	21.3	21.3	21.4	22.2	24.4
16	HENDERSON	17	8.7	8.9	9.0	9.5	10.4
17	HENRY	17	57.0	59.1	61.0	63.8	68.2
18	JEFFERSON	17	33.9	34.5	35.9	37.1	39.4
19	JERSEY	17	19.9	20.2	20.8	21.9	23.0
20	JO DAVIESS	17	21.5	22.3	23.2	24.0	25.1
21	KNOX	17	63.3	65.2	66.8	70.6	76.4
22	LA SALLE	17	107.5	110.8	116.0	121.8	126.4
23	LEE	17	34.6	38.0	41.4	45.1	49.1
24	MC DUNOUGH	17	40.3	45.3	48.5	52.0	60.4
25	MACOUPIN	17	46.0	47.7	50.3	52.1	55.2
26	MADISON	17	251.3	250.3	265.3	285.7	293.1
27	MARION	17	39.4	42.1	43.8	45.2	45.6
28	MARSHALL	17	13.1	13.3	13.5	13.7	13.7
29	MASON	17	17.0	16.8	17.7	20.0	22.9
30	MCNARD	17	10.7	11.0	11.6	12.0	12.8
31	MERCER	17	18.3	19.1	19.9	21.3	23.4
32	MONROE	17	20.9	21.3	21.4	23.9	25.2
33	MONTGOMERY	17	30.7	31.1	31.9	32.4	33.9
34	MORGAN	17	34.4	35.6	37.6	39.0	41.6
35	OGLE	17	43.4	45.4	47.7	50.7	54.2
36	PEORIA	17	204.8	212.0	219.4	227.2	237.5
37	PERRY	17	19.6	19.5	20.1	20.4	20.9
38	PIKE	17	18.3	18.0	18.1	18.5	20.2
39	PULNAM	17	6.0	6.0	6.6	7.2	7.6
40	RANDOLPH	17	32.9	33.6	34.9	36.6	38.4
41	ROCK ISLAND	17	164.6	176.4	183.4	192.3	206.3
42	ST CLAIR	17	286.2	286.6	301.2	310.4	328.9
43	SANGAMON	17	170.1	178.9	192.4	201.9	217.2
44	SCHUYLER	17	7.3	7.2	7.2	7.4	8.1
45	SCOTT	17	5.6	5.5	5.5	5.4	5.6
46	STARK	17	7.3	7.5	7.6	7.3	7.4
47	STEPHENSON	17	48.2	47.9	49.8	52.0	54.5
48	WARREN	17	22.7	23.4	23.8	25.0	26.9
49	WASHINGTON	17	15.1	15.3	15.6	15.7	16.0
50	WHITESIDE	17	66.1	69.8	73.0	78.2	85.8
51	WINNEHAGO	17	243.1	260.0	278.6	298.5	321.1
52	ALLAMAKEE	19	15.7	16.3	16.8	17.2	17.6
53	HENTON	19	23.2	23.6	24.0	24.3	24.4
54	BLACK HAWK	19	138.6	142.0	145.1	147.7	150.0
55	BREMEN	19	26.0	27.3	28.3	28.8	29.0
56	BUCHANAN	19	22.9	23.9	25.0	26.0	26.9
57	CEDAR	19	16.6	16.7	16.2	16.0	15.8
58	CHICKASAW	19	15.5	16.1	16.8	17.5	18.1
59	CLAYTON	19	21.5	22.3	23.0	23.7	24.2
60	CLINTON	19	54.9	62.1	64.3	66.2	67.7

61	DAVIS	19	4.8	4.7	4.8	4.7	4.8
62	DELAWARE	19	14.5	20.3	21.4	22.1	21.2
63	DES MOINES	19	44.0	44.4	44.4	44.9	45.2
64	DURAND	19	94.3	103.1	104.3	113.2	117.5
65	FAYETTE	19	27.2	27.4	28.3	28.7	29.1
66	HENRY	19	17.3	17.1	17.1	17.2	17.3
67	HOWARD	19	11.7	12.1	12.5	12.8	13.0
68	IOWA	19	15.5	15.7	16.0	16.2	16.4
69	JACKSON	19	21.9	22.7	23.6	24.5	25.3
70	JEFFERSON	19	13.1	12.3	11.7	11.3	11.1
71	JOHNSON	19	80.7	84.7	88.6	92.1	95.2
72	JONES	19	20.3	20.4	21.3	21.8	22.3
73	KFOKUK	19	13.6	13.7	13.7	13.7	13.8
74	LEF	19	34.9	39.2	39.0	39.1	39.4
75	LINN	19	167.7	170.4	174.0	177.8	181.2
76	LOUISA	19	11.0	11.2	11.4	11.5	11.6
77	MUSCATINE	19	41.2	43.5	45.7	47.5	48.8
78	SCOTT	19	154.9	164.8	172.9	180.1	186.0
79	VAN HUREN	19	7.7	7.4	7.3	7.1	7.0
80	WAPELLO	19	37.9	36.6	35.7	35.1	34.4
81	WASHINGTON	19	14.4	14.8	15.4	15.2	15.1
82	WINNEBIEG	19	21.0	20.0	20.9	20.4	21.0
83	WYOKA	27	200.3	225.0	255.5	283.0	305.9
84	WENTON	27	23.4	25.2	27.0	28.6	29.7
85	CARVER	27	34.4	36.5	40.3	43.8	46.9
86	CHISAGO	27	23.9	28.5	34.0	38.4	44.9
87	DAKOTA	27	181.1	204.3	234.6	264.8	293.3
88	DODGE	27	13.2	13.4	13.6	13.6	13.4
89	FILLMORE	27	21.1	20.9	20.7	20.2	19.5
90	GOODHUE	27	38.4	41.1	43.6	46.3	48.6
91	HENNEPIN	27	483.4	1005.2	1018.1	1019.2	1011.1
92	HOUSTON	27	18.2	18.4	18.8	19.1	19.2
93	ISANTI	27	21.7	25.3	24.0	33.0	37.4
94	LE SUEUR	27	22.9	23.8	24.4	24.9	25.1
95	MC LEOD	27	31.4	34.1	36.8	39.5	42.3
96	MEEREN	27	19.7	20.5	20.9	21.4	21.4
97	MOWER	27	44.1	44.9	45.0	44.5	43.1
98	OLMSTED	27	97.8	105.9	114.1	121.5	127.4
99	RAMSEY	27	485.7	494.4	498.4	495.0	487.2
100	RICE	27	44.7	46.4	47.6	49.0	50.2
101	SCOTT	27	39.1	43.0	47.8	52.5	56.8
102	SHERBURNE	27	25.5	29.6	34.0	39.4	45.3
103	STEELE	27	16.1	16.3	16.4	16.5	16.3
104	STEELE	27	29.0	30.3	31.2	31.8	31.9
105	WARASHA	27	14.3	14.7	14.8	14.8	14.8
106	WASHINGTON	27	103.7	113.4	128.1	142.1	154.4
107	WINONA	27	44.8	48.1	48.9	49.6	50.1
108	WRIGHT	27	51.2	54.6	60.5	74.3	87.0
109	ADAIR	24	26.1	28.0	30.0	32.2	34.5
110	AUDRAIN	24	25.9	26.2	26.5	26.8	27.1
111	ROONE	24	94.5	98.2	101.9	105.9	109.9
112	CALLAWAY	24	24.4	29.9	31.4	33.0	34.7
113	CLARK	24	7.8	7.6	7.4	7.2	7.0
114	FRANKLIN	24	70.3	80.8	91.2	104.4	118.3
115	GASCONADE	24	13.6	14.6	15.7	16.9	18.1
116	JEFFERSON	24	134.9	156.9	178.9	208.1	237.3
117	KNOX	24	5.2	5.0	4.8	4.6	4.4
118	LEWIS	24	10.4	10.0	9.7	9.4	9.0
119	LINCOLN	24	21.5	24.0	26.4	29.4	32.4
120	MACON	24	14.2	14.4	14.4	14.0	14.7
121	MARION	24	27.7	27.6	27.5	27.4	27.3
122	MONROE	24	10.5	11.2	12.0	12.8	13.7
123	MONTGOMERY	24	11.8	12.4	12.9	13.5	14.1
124	PIKE	24	17.2	17.4	17.7	18.0	18.2
125	WALLS	24	4.2	10.2	11.2	12.4	13.6
126	WANDOLPH	24	25.6	27.7	29.8	32.2	34.7

127	ST CHARLES	29	144.4	145.4	107.1	244.6	201.8
128	ST FRANCIS	29	40.4	42.8	45.1	47.7	50.3
129	ST LOUIS	29	971.7	993.8	1015.9	1039.0	1062.1
130	STE GENEVI	29	14.3	15.2	16.2	17.3	18.4
131	SCHUYLER	29	5.1	5.4	6.2	6.8	7.3
132	SCOTLAND	29	5.5	5.5	5.5	5.5	5.5
133	SHELBY	29	7.6	7.6	7.5	7.4	7.4
134	WARREN	29	14.5	14.4	22.4	28.5	34.6
135	WASHINGTON	29	17.2	18.6	20.0	21.6	23.3
136	ST LOUIS C	29	44.5	40.0	340.4	296.3	252.2
137	ADAMS	55	12.7	14.9	17.1	19.9	22.5
138	BARRON	55	39.1	42.5	45.8	48.7	51.0
139	HUFFALO	55	14.6	15.3	15.9	16.4	16.8
140	CHIPPewa	55	50.8	53.2	55.7	57.6	59.1
141	CLARK	55	31.7	33.0	34.4	35.5	36.0
142	CRAWFORD	55	15.8	16.3	16.8	17.2	17.2
143	DUNN	55	31.2	32.3	33.3	34.2	35.2
144	EAU CLAIRE	55	21.0	22.5	24.8	26.8	28.6
145	GRANT	55	53.2	56.0	58.8	61.3	63.4
146	GREEN	55	30.0	31.7	33.5	35.1	36.5
147	IOWA	55	14.7	15.4	16.2	17.0	17.7
148	JACKSON	55	16.3	17.0	17.7	18.1	18.3
149	JUNEAU	55	20.1	21.2	22.5	23.5	24.3
150	LA CROSSE	55	85.8	88.9	91.6	93.8	95.6
151	LAFAYETTE	55	14.7	19.7	20.9	21.9	22.4
152	MONROE	55	34.5	36.7	38.8	40.4	41.5
153	PEPIN	55	7.4	7.6	7.9	8.0	8.1
154	PIENCE	55	32.4	35.8	39.4	43.2	47.1
155	POLK	55	33.2	37.3	41.8	46.0	50.1
156	RICHLAND	55	16.0	15.8	15.6	15.2	14.7
157	ROCK	55	145.4	154.8	164.6	173.3	180.2
158	ST CROIX	55	43.6	49.9	57.0	64.1	70.8
159	SAUK	55	41.8	43.8	45.8	47.2	48.3
160	TREMPEALEA	55	24.7	25.8	26.8	27.7	28.3
161	VERNON	55	25.6	26.6	27.5	28.1	28.3
162	WOOD	55	70.0	73.5	77.0	79.9	81.5

DISTANCES FROM CUMULUS TO JUNE 1963		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
1	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
2	349	330	325	319	316	310	304	298	292	285	278	271	264	256	249	241	233	225	217	210	202	194	186	178	170	162	154	146	138	130	122	114	106	98	90	82	74	66	58	50	42	34	26	18	10	2	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	

100 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198 199 200 201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216 217 218 219 220 221 222 223 224 225 226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241 242 243 244 245 246 247 248 249 250 251 252 253 254 255 256 257 258 259 260 261 262 263 264 265 266 267 268 269 270 271 272 273 274 275 276 277 278 279 280 281 282 283 284 285 286 287 288 289 290 291 292 293 294 295 296 297 298 299 300 301 302 303 304 305 306 307 308 309 310 311 312 313 314 315 316 317 318 319 320 321 322 323 324 325 326 327 328 329 330 331 332 333 334 335 336 337 338 339 340 341 342 343 344 345 346 347 348 349 350 351 352 353 354 355 356 357 358 359 360 361 362 363 364 365 366 367 368 369 370 371 372 373 374 375 376 377 378 379 380 381 382 383 384 385 386 387 388 389 390 391 392 393 394 395 396 397 398 399 400 401 402 403 404 405 406 407 408 409 410 411 412 413 414 415 416 417 418 419 420 421 422 423 424 425 426 427 428 429 430 431 432 433 434 435 436 437 438 439 440 441 442 443 444 445 446 447 448 449 450 451 452 453 454 455 456 457 458 459 460 461 462 463 464 465 466 467 468 469 470 471 472 473 474 475 476 477 478 479 480 481 482 483 484 485 486 487 488 489 490 491 492 493 494 495 496 497 498 499 500 501 502 503 504 505 506 507 508 509 510 511 512 513 514 515 516 517 518 519 520 521 522 523 524 525 526 527 528 529 530 531 532 533 534 535 536 537 538 539 540 541 542 543 544 545 546 547 548 549 550 551 552 553 554 555 556 557 558 559 560 561 562 563 564 565 566 567 568 569 570 571 572 573 574 575 576 577 578 579 580 581 582 583 584 585 586 587 588 589 590 591 592 593 594 595 596 597 598 599 600 601 602 603 604 605 606 607 608 609 610 611 612 613 614 615 616 617 618 619 620 621 622 623 624 625 626 627 628 629 630 631 632 633 634 635 636 637 638 639 640 641 642 643 644 645 646 647 648 649 650 651 652 653 654 655 656 657 658 659 660 661 662 663 664 665 666 667 668 669 670 671 672 673 674 675 676 677 678 679 680 681 682 683 684 685 686 687 688 689 690 691 692 693 694 695 696 697 698 699 700 701 702 703 704 705 706 707 708 709 710 711 712 713 714 715 716 717 718 719 720 721 722 723 724 725 726 727 728 729 730 731 732 733 734 735 736 737 738 739 740 741 742 743 744 745 746 747 748 749 750 751 752 753 754 755 756 757 758 759 760 761 762 763 764 765 766 767 768 769 770 771 772 773 774 775 776 777 778 779 780 781 782 783 784 785 786 787 788 789 790 791 792 793 794 795 796 797 798 799 800 801 802 803 804 805 806 807 808 809 810 811 812 813 814 815 816 817 818 819 820 821 822 823 824 825 826 827 828 829 830 831 832 833 834 835 836 837 838 839 840 841 842 843 844 845 846 847 848 849 850 851 852 853 854 855 856 857 858 859 860 861 862 863 864 865 866 867 868 869 870 871 872 873 874 875 876 877 878 879 880 881 882 883 884 885 886 887 888 889 890 891 892 893 894 895 896 897 898 899 900 901 902 903 904 905 906 907 908 909 910 911 912 913 914 915 916 917 918 919 920 921 922 923 924 925 926 927 928 929 930 931 932 933 934 935 936 937 938 939 940 941 942 943 944 945 946 947 948 949 950 951 952 953 954 955 956 957 958 959 960 961 962 963 964 965 966 967 968 969 970 971 972 973 974 975 976 977 978 979 980 981 982 983 984 985 986 987 988 989 990 991 992 993 994 995 996 997 998 999 1000

129	548	540	574	540	517	494	442	469	440	441	413	340	350	324	302	271	252	244	237	205	181	158	137	114	98	65	31	
130	646	638	631	614	594	575	552	510	526	517	494	471	437	406	384	357	324	309	302	294	263	241	216	195	174	147	116	87
131	403	196	349	378	363	345	324	320	313	304	284	266	245	220	211	207	181	162	143	120	111	85	69	79	96	123	154	188
132	404	400	393	382	365	346	324	318	309	301	284	260	238	209	199	192	165	144	124	102	97	62	46	60	80	107	141	170
133	463	455	450	437	419	401	382	370	363	355	338	312	280	250	244	232	202	181	163	140	123	89	54	41	46	69	100	129
134	561	553	546	534	515	495	473	460	450	444	423	394	363	335	314	292	261	240	231	218	188	161	131	104	86	63	46	47
135	631	622	615	604	584	563	540	529	517	509	490	463	429	401	380	356	325	305	297	286	255	229	201	178	154	131	104	87
136	542	544	535	523	503	482	470	459	441	433	413	381	349	326	299	270	251	246	239	207	187	166	145	123	96	64	33	
137	242	232	232	216	193	164	137	127	110	101	94	104	122	131	139	163	143	125	107	227	243	270	301	336	359	376	412	434
138	74	75	76	71	72	81	100	112	127	134	157	183	216	250	276	309	335	349	351	359	389	413	443	467	487	509	538	565
139	110	104	94	83	59	31	17	27	41	53	73	98	131	165	191	225	250	263	250	273	304	328	359	382	403	424	451	478
140	118	116	114	102	89	78	88	87	95	102	115	149	183	217	237	264	296	313	316	324	357	384	415	439	459	480	505	531
141	170	166	163	149	130	108	93	80	86	87	100	125	156	181	203	230	260	278	286	294	328	357	390	413	432	451	475	500
142	223	216	210	193	170	139	110	96	78	67	46	27	31	50	74	107	134	150	154	168	197	226	260	282	303	322	345	370
143	84	83	81	69	54	50	62	74	87	98	118	144	174	210	237	270	295	309	313	320	351	374	405	428	450	472	494	524
144	135	130	127	112	93	69	58	61	62	68	86	112	147	178	201	232	245	277	282	291	322	348	381	404	424	444	471	496
145	253	247	234	224	201	171	143	120	112	101	81	56	31	17	39	73	98	114	121	134	163	193	227	250	270	287	310	336
146	309	301	294	276	255	224	193	160	162	150	131	115	100	77	66	67	96	114	135	154	172	200	246	266	282	293	311	332
147	271	265	259	251	217	188	158	144	125	114	95	78	66	50	54	73	104	125	137	154	180	211	247	269	286	301	322	345
148	169	163	158	143	120	93	68	61	50	46	58	83	114	141	164	193	222	239	246	258	287	316	349	372	392	412	435	461
149	219	213	208	193	170	140	112	101	85	77	71	83	104	120	135	159	190	209	220	235	262	293	320	351	370	386	400	424
150	175	169	163	147	123	93	62	49	31	19	22	46	77	107	131	164	191	208	212	222	253	280	313	336	356	377	401	426
151	280	283	274	262	237	206	178	164	146	127	115	93	73	44	35	47	70	100	112	131	154	187	224	245	262	278	297	301
152	194	188	183	167	134	113	85	73	56	46	45	62	80	112	133	162	190	208	216	224	259	286	320	343	363	382	405	429
153	89	83	74	63	42	23	35	46	64	75	95	120	152	186	213	247	272	285	286	324	347	377	401	421	444	471	494	
154	61	54	50	34	14	27	55	69	87	99	118	141	171	206	234	268	291	303	303	307	339	356	388	412	432	456	485	513
155	62	63	66	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64
156	232	225	220	204	178	148	118	104	85	73	58	48	57	68	85	112	142	160	170	184	212	242	277	299	318	336	350	382
157	340	332	327	311	286	255	224	212	194	189	165	150	139	113	100	89	114	135	154	177	193	226	262	280	293	303	316	334
158	52	50	44	34	31	53	77	91	100	120	140	164	196	232	259	292	315	328	334	334	365	388	417	440	461	484	512	544
159	256	250	245	229	205	174	144	131	113	102	89	85	98	100	100	120	150	170	183	201	227	259	293	314	332	348	368	390
160	139	132	127	112	87	58	35	29	35	54	81	115	147	173	205	232	247	250	259	289	316	347	370	392	413	443	465	
161	204	197	191	175	154	120	80	77	58	46	29	20	54	70	102	133	161	174	183	196	225	254	282	310	331	349	373	397
162	213	208	205	191	170	139	121	114	102	97	101	120	145	162	179	202	233	252	262	278	306	336	370	394	413	428	451	473

ALLOCATED POPULATION BY POOL, ZONE AND YEAR

<u>ZONE</u>	<u>MILES</u>
1	0-25
2	26-50
3	51-75

<u>YEAR</u>	
1	1980
2	1985
3	1990
4	1995
5	2000

ALLOCATED POPULATION BY POOL, ZONE, AND YEAR

YEAR	1			
POOL	1	1569.4	480.6	325.2
POOL	2	1773.1	395.0	307.1
POOL	3	1772.8	576.5	263.4
POOL	4	170.5	1341.9	351.0
POOL	5	70.8	923.6	1488.6
POOL	6	25.7	214.4	1106.6
POOL	7	32.9	176.7	374.6
POOL	8	46.8	287.9	273.8
POOL	9	46.8	140.7	294.2
POOL	10	104.0	169.0	240.5
POOL	11	104.0	159.4	134.3
POOL	12	15.7	203.9	194.5
POOL	13	21.5	250.7	156.9
POOL	14	151.5	137.4	330.9
POOL	15	120.2	212.5	543.8
POOL	16	40.9	372.1	824.1
POOL	17	253.3	284.5	433.8
POOL	18	343.5	202.5	278.5
POOL	19	344.8	185.7	570.3
POOL	20	52.2	542.6	467.6
POOL	21	53.7	458.0	312.2
POOL	22	34.9	149.9	242.3
POOL	23	7.8	177.1	230.3
POOL	24	105.2	56.2	220.5
POOL	25	76.3	96.8	128.0
POOL	26	35.5	130.1	316.9
POOL	27	43.1	204.9	1895.5
POOL	28	158.7	2066.9	359.7

ALLOCATED POPULATION BY POOL, ZONE, AND YEAR

YEAR	2				
P00L	1	1724.3	540.2	352.4	
P00L	2	1837.7	447.1	332.1	
P00L	3	1612.7	648.3	248.2	
P00L	4	811.8	1446.4	325.4	
P00L	5	76.4	977.4	1549.5	
P00L	6	26.3	230.4	1147.1	
P00L	7	34.0	187.4	390.2	
P00L	8	44.1	301.5	287.3	
P00L	9	48.1	146.3	310.2	
P00L	10	107.3	175.1	294.3	
P00L	11	107.3	164.9	138.3	
P00L	12	16.3	209.2	201.6	
P00L	13	22.3	260.7	161.7	
P00L	14	154.1	142.5	338.6	
P00L	15	125.8	220.9	561.9	
P00L	16	42.0	387.0	867.6	
P00L	17	296.7	294.4	451.0	
P00L	18	400.5	210.8	284.7	
P00L	19	350.3	192.4	543.1	
P00L	20	54.7	560.2	477.2	
P00L	21	53.7	474.0	321.3	
P00L	22	44.0	154.5	246.1	
P00L	23	7.6	175.5	238.0	
P00L	24	104.5	56.7	227.7	
P00L	25	77.1	46.8	130.6	
P00L	26	35.4	133.0	355.7	
P00L	27	45.4	244.9	1862.0	
P00L	28	141.0	2036.8	334.7	

ALLOCATED POPULATION BY POOL, ZONE, AND YEAR

YEAR 3

POOL	1	1771.6	617.3	379.8
POOL	2	1899.7	512.2	356.8
POOL	3	1544.2	737.6	314.1
POOL	4	860.7	1509.0	423.6
POOL	5	83.0	1039.8	1627.7
POOL	6	26.7	246.3	1235.1
POOL	7	34.7	197.7	404.5
POOL	8	48.9	314.6	299.8
POOL	9	48.9	191.5	325.6
POOL	10	110.4	180.4	307.6
POOL	11	110.4	169.7	142.2
POOL	12	16.8	214.2	208.0
POOL	13	23.0	271.3	167.1
POOL	14	167.1	148.2	347.2
POOL	15	131.9	230.0	543.4
POOL	16	43.3	404.5	914.1
POOL	17	310.2	304.3	471.4
POOL	18	417.3	219.1	291.3
POOL	19	376.2	198.6	596.8
POOL	20	57.1	579.0	487.2
POOL	21	53.8	488.7	331.8
POOL	22	83.8	157.6	293.4
POOL	23	7.4	177.1	244.9
POOL	24	106.4	57.1	234.7
POOL	25	80.4	97.3	133.5
POOL	26	35.8	138.5	345.8
POOL	27	47.8	281.8	1848.5
POOL	28	223.4	2038.0	431.1

ALLOCATED POPULATION BY POOL • ZONE • AND YEAR

YEAR	4				
POOL	1	1747.2	690.3	406.8	
POOL	2	1439.3	572.9	382.1	
POOL	3	1656.3	822.8	337.9	
POOL	4	901.9	1557.3	457.1	
POOL	5	84.5	1094.5	1677.7	
POOL	6	27.0	261.6	1244.2	
POOL	7	35.4	206.8	416.8	
POOL	8	44.6	325.7	310.8	
POOL	9	49.6	195.3	338.9	
POOL	10	112.9	144.1	319.2	
POOL	11	112.9	173.4	144.8	
POOL	12	17.2	218.0	213.0	
POOL	13	23.7	280.8	171.4	
POOL	14	174.5	153.2	355.1	
POOL	15	137.7	238.4	605.9	
POOL	16	44.9	422.9	965.1	
POOL	17	324.5	317.5	445.0	
POOL	18	436.2	229.2	301.5	
POOL	19	393.7	205.0	616.3	
POOL	20	54.0	599.9	501.3	
POOL	21	54.4	510.0	344.3	
POOL	22	84.0	143.0	306.7	
POOL	23	7.2	181.1	254.0	
POOL	24	109.7	58.6	242.8	
POOL	25	85.3	48.3	137.8	
POOL	26	36.5	146.2	453.5	
POOL	27	50.7	336.9	1857.3	
POOL	28	271.8	2057.4	480.1	

ALLOCATED POPULATION BY POOL, ZONE, AND YEAR

YEAR	5				
POOL	1	1804.2	765.6	431.2	
POOL	2	1958.6	636.7	405.7	
POOL	3	1652.7	902.7	364.9	
POOL	4	434.9	1540.5	434.9	
POOL	5	95.7	1139.8	1712.8	
POOL	6	27.1	275.1	1342.5	
POOL	7	35.8	213.9	426.6	
POOL	8	50.1	333.9	319.6	
POOL	9	50.1	197.7	349.5	
POOL	10	114.8	186.0	328.4	
POOL	11	114.8	175.7	146.1	
POOL	12	17.6	220.2	216.6	
POOL	13	24.2	289.0	173.9	
POOL	14	180.9	156.6	362.3	
POOL	15	142.8	246.1	628.0	
POOL	16	47.1	441.7	1024.2	
POOL	17	339.5	337.6	521.7	
POOL	18	460.5	241.5	315.6	
POOL	19	415.7	212.1	641.6	
POOL	20	60.4	625.8	519.3	
POOL	21	55.6	546.0	358.9	
POOL	22	84.6	176.1	329.1	
POOL	23	7.0	191.5	271.2	
POOL	24	117.8	62.0	258.4	
POOL	25	45.1	101.0	144.4	
POOL	26	38.4	159.6	513.3	
POOL	27	53.7	393.4	1851.3	
POOL	28	320.1	2074.5	531.2	

RECREATION ACTIVITY
Pools By Activity By Year

RECREATION ACTIVITY BASE PARTICIPATION RATES

1975

<u>River, Urban</u>	<u>Picnic</u>	<u>Camp</u>	<u>Swim</u>	<u>Water Skiing</u>	<u>Boating</u>	<u>Sight- seeing</u>	<u>Fishing</u>
<u>Zone</u>							
I	0.008	0.005	0.001	0.007	0.058	0.003	0.016
II	0.004	0.001	0.001	0.002	0.030	0.051	0.012
III	--	--	--	--	--	--	--

Lake

Zone

I	0.897	1.008	1.266	2.833	7.193	1.663	4.525
II	0.060	0.245	0.114	0.130	0.192	0.077	0.323
III	0.024	0.026	0.028	0.008	0.141	0.035	0.125

River, Rural

Zone

I	0.200	0.189	0.166	0.298	1.109	0.413	1.079
II	0.047	0.060	0.044	0.094	0.271	0.097	0.303
III	0.027	0.022	0.024	0.032	0.107	0.046	0.127

Source: GREAT Recreation Demand Analysis (June 1976).

RECREATIONAL ACTIVITIES - POOLS BY ACTIVITY BY YEAR

YEAR	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
POOL 1	15.24	8.83	2.15	12.65	111.24	29.52	32.48																					
POOL 2	15.76	9.26	2.17	13.20	114.69	25.46	33.11																					
POOL 3	14.49	4.44	2.15	12.16	100.52	34.12	32.00																					
POOL 4	11.64	5.23	2.15	8.16	86.15	72.79	28.91																					
POOL 5	97.76	101.55	88.12	155.55	488.09	187.31	545.30																					
POOL 6	62.48	107.21	87.94	109.53	382.86	97.98	323.87																					
POOL 7	25.00	25.06	22.23	38.40	124.45	47.96	136.61																					
POOL 8	30.28	32.14	27.01	49.77	159.22	59.85	172.50																					
POOL 9	25.80	26.14	22.78	40.35	132.35	50.39	142.61																					
POOL 10	36.32	35.07	31.43	55.85	191.15	72.25	199.05																					
POOL 11	31.92	32.17	27.50	50.27	172.90	64.59	177.57																					
POOL 12	38.98	38.84	48.57	72.54	179.50	60.62	161.21																					
POOL 13	20.32	22.56	18.37	34.99	108.57	40.41	119.09																					
POOL 14	45.64	44.16	39.14	68.65	240.66	91.12	247.12																					
POOL 15	48.71	47.43	42.35	73.20	249.08	95.27	263.15																					
POOL 16	47.92	48.19	42.94	73.54	234.38	90.89	261.54																					
POOL 17	81.74	80.16	69.96	125.05	437.70	164.55	446.98																					
POOL 18	93.74	90.74	79.25	142.23	509.98	190.84	510.52																					
POOL 19	93.09	88.86	79.09	138.46	493.73	186.65	500.73																					
POOL 20	48.57	52.71	43.76	81.52	254.97	95.70	280.12																					
POOL 21	40.70	44.50	36.54	69.04	217.08	80.97	236.37																					
POOL 22	31.65	31.25	27.46	48.42	164.98	62.59	172.88																					
POOL 23	16.10	17.17	14.61	26.34	81.29	30.99	91.33																					
POOL 24	29.63	28.11	25.23	43.40	155.40	59.04	158.54																					
POOL 25	23.27	23.04	20.00	35.93	124.55	46.79	127.91																					
POOL 26	21.77	21.60	19.22	32.05	108.53	41.86	117.97																					
POOL 27	49.67	47.34	41.84	63.14	307.23	125.24	350.53																					
POOL 28	130.60	161.92	125.22	251.04	774.62	282.58	843.19																					

RECREATIONAL ACTIVITIES - POOLS BY ACTIVITY BY YEAR

YEAR	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
POOL	1	15.96	9.16	2.26	13.15	116.22	32.72	34.07																			
POOL	2	16.49	9.64	2.28	13.76	120.00	28.32	34.77																			
POOL	3	15.44	8.71	2.24	12.59	112.99	37.90	33.58																			
POOL	4	12.28	5.51	2.26	8.58	90.48	76.20	30.35																			
POOL	5	103.42	107.49	93.20	164.70	517.02	198.30	577.18																			
POOL	6	65.43	113.30	92.24	113.80	397.97	102.33	339.31																			
POOL	7	26.14	26.25	23.25	40.23	130.24	50.17	143.02																			
POOL	8	31.55	33.50	28.15	51.87	165.79	62.33	179.74																			
POOL	9	26.75	27.00	23.63	41.77	137.02	52.21	147.74																			
POOL	10	37.64	37.26	32.58	57.85	197.94	74.84	206.21																			
POOL	11	32.94	33.22	28.39	51.90	178.48	66.67	183.31																			
POOL	12	32.01	32.93	28.13	74.90	185.84	50.27	166.53																			
POOL	13	21.08	23.41	19.05	36.33	112.68	41.94	123.59																			
POOL	14	47.66	46.07	40.81	71.64	251.29	95.11	257.85																			
POOL	15	50.71	49.30	44.00	74.23	259.50	90.23	274.03																			
POOL	16	50.01	50.25	44.82	74.66	244.29	94.79	272.76																			
POOL	17	85.35	83.66	73.03	130.52	457.08	171.84	466.62																			
POOL	18	97.69	94.61	82.59	148.27	531.74	198.95	532.17																			
POOL	19	96.85	92.47	82.27	144.11	514.10	194.29	521.11																			
POOL	20	50.15	54.45	45.18	84.23	263.54	98.88	289.37																			
POOL	21	41.69	45.66	37.48	70.84	222.39	82.94	242.37																			
POOL	22	31.79	31.44	27.61	48.71	165.64	62.44	173.78																			
POOL	23	16.19	17.20	14.70	26.38	81.45	31.11	91.60																			
POOL	24	29.71	28.16	25.31	43.76	155.62	59.13	158.85																			
POOL	25	23.50	23.25	20.19	36.25	125.71	47.24	129.11																			
POOL	26	22.93	22.50	20.27	34.43	113.36	43.88	123.67																			
POOL	27	70.86	64.24	61.00	96.13	315.94	128.16	359.67																			
POOL	28	144.54	164.09	140.00	241.01	806.02	294.41	873.37																			

RECREATIONAL ACTIVITIES - POOLS BY ACTIVITY BY YEAR

YEAR	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
POOL	17.14	17.81	16.54	11.44	114.64	76.94	28.05	33.62	28.25	39.85	34.64	33.62	22.57	51.69	55.10	54.91	93.19	106.15	105.02	53.53	44.15	32.74	16.41	31.25	25.40	26.42	76.12	164.02
	9.68	10.27	9.10	6.07	119.49	124.04	28.27	35.75	28.55	39.41	34.93	76.29	25.10	49.98	53.64	55.09	91.27	102.83	100.27	58.17	48.46	32.40	17.81	29.59	25.05	25.64	70.66	145.34
	2.49	2.51	2.44	2.46	103.28	100.24	24.98	30.02	24.96	34.50	29.85	52.59	20.40	44.23	47.89	49.22	79.72	89.73	89.17	48.22	39.73	28.48	15.26	26.62	21.79	23.34	67.81	147.17
	13.96	14.72	13.24	9.43	183.24	120.45	43.33	55.34	43.98	61.16	54.58	78.77	38.94	77.76	82.83	84.02	142.39	161.18	156.31	90.01	75.17	50.17	27.30	45.97	34.07	39.13	106.21	283.76
	124.95	129.67	120.75	99.03	575.38	424.92	139.90	176.53	144.19	209.25	187.69	195.61	120.72	273.03	282.15	267.67	498.88	578.12	558.11	281.64	235.38	170.15	84.24	163.52	135.94	128.62	346.26	910.35
	40.60	35.04	44.93	82.13	220.30	110.34	53.85	66.37	55.02	79.17	70.11	52.84	44.91	103.26	107.87	103.96	187.59	216.25	210.83	105.62	87.77	64.61	32.22	62.16	51.10	50.12	139.05	333.91
	37.04	37.90	36.37	33.12	641.27	348.45	153.79	191.60	155.73	218.14	192.75	174.87	132.42	279.80	287.76	299.15	509.20	578.40	565.19	309.10	256.95	178.98	94.90	166.96	139.32	141.28	392.66	977.64

YEAR- 5-

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GROWTH RATES APPLIED TO POOLS
BY ACTIVITIES BY YEAR

ACTIVITY GROWTH RATES

<u>Recreation Activity</u>	<u>Years</u>				
	<u>1980</u>	<u>1985</u>	<u>1990</u>	<u>1995</u>	<u>2000</u>
Picnicking	1.00	1.15	1.30	1.45	1.60
Camping	1.00	1.30	1.60	1.90	2.20
Swimming	1.00	1.25	1.50	1.75	2.00
Water Skiing	1.00	1.45	1.90	2.35	2.80
Boating	1.00	1.25	1.50	1.75	2.00
Sightseeing	1.00	1.20	1.40	1.60	1.80
Fishing	1.00	1.05	1.10	1.15	1.20

Source: MRI COMPATRAX recreation participation/allocation model.

GRUWTH RATES APPLIED TO POOLS BY ACTIVITIES BY YEAR

YEAR	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
POOL 1	15.28	8.83	2.15	12.65	111.24	29.52	32.48																					
POOL 2	15.76	9.26	2.17	13.20	114.69	25.46	33.11																					
POOL 3	16.84	8.44	2.15	12.16	108.52	34.12	32.08																					
POOL 4	11.64	5.23	2.15	8.16	86.15	72.79	28.91																					
POOL 5	97.76	101.55	88.12	155.55	488.09	187.31	545.30																					
POOL 6	62.44	107.21	87.06	100.53	382.06	97.08	323.87																					
POOL 7	25.00	25.06	22.23	38.40	124.45	47.96	136.61																					
POOL 8	30.28	32.14	27.01	49.77	159.22	59.85	172.50																					
POOL 9	25.80	26.16	22.28	40.35	132.35	50.39	142.61																					
POOL 10	36.32	35.97	31.43	55.85	191.15	72.25	199.05																					
POOL 11	31.92	32.17	27.50	50.27	172.90	64.59	177.57																					
POOL 12	30.98	30.84	28.57	72.54	179.50	48.62	161.21																					
POOL 13	20.32	22.56	18.37	34.99	108.57	40.41	119.09																					
POOL 14	45.69	44.16	39.14	68.65	240.66	91.12	247.12																					
POOL 15	48.71	47.43	42.35	73.20	249.08	95.27	263.15																					
POOL 16	47.92	48.19	42.94	73.54	234.38	90.89	261.54																					
POOL 17	81.74	80.16	69.96	125.05	437.70	164.55	446.98																					
POOL 18	93.74	90.76	79.25	142.23	509.98	190.84	510.52																					
POOL 19	93.09	88.86	79.09	138.46	493.73	186.65	500.73																					
POOL 20	68.57	52.71	43.76	81.52	254.97	95.70	280.12																					
POOL 21	40.70	44.50	36.56	69.04	217.08	80.97	236.37																					
POOL 22	31.65	31.25	27.46	48.42	164.98	62.59	172.88																					
POOL 23	16.10	17.17	14.61	26.34	81.29	30.99	91.33																					
POOL 24	29.63	28.11	25.23	43.49	155.49	59.04	158.54																					
POOL 25	23.27	23.04	20.00	35.93	124.55	46.79	127.91																					
POOL 26	21.77	21.49	19.22	32.95	108.53	41.86	117.97																					
POOL 27	69.67	67.38	61.44	93.14	307.24	125.26	350.53																					
POOL 28	118.60	161.92	125.42	253.09	774.62	282.58	843.19																					

REF - 2

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GROWTH RATES APPLIED TO POOLS BY ACTIVITIES BY YEAR

YEAR	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
POOL 1	21.63	15.16	3.54	25.91	181.91	51.52	39.33																			
POOL 2	22.42	16.02	3.62	27.21	188.32	44.55	40.20																			
POOL 3	28.94	14.33	3.57	24.47	176.24	59.57	38.67																			
POOL 4	16.80	9.30	3.55	17.18	142.79	111.36	35.07																			
POOL 5	142.24	182.22	147.89	331.67	822.00	294.02	672.47																			
POOL 6	88.84	190.90	144.60	223.33	620.24	149.23	390.24																			
POOL 7	35.30	43.71	36.25	79.55	203.01	72.96	163.59																			
POOL 8	42.46	55.54	43.73	102.10	257.35	90.30	204.78																			
POOL 9	35.84	44.43	36.54	81.49	211.45	75.25	167.35																			
POOL 10	50.52	61.53	50.47	113.43	306.35	108.14	234.13																			
POOL 11	44.06	54.68	43.81	101.46	275.46	96.04	207.46																			
POOL 12	42.79	114.71	77.27	146.50	286.95	12.40	188.33																			
POOL 13	28.42	38.88	29.65	71.64	175.36	60.90	141.07																			
POOL 14	64.69	76.98	63.89	142.19	393.94	139.10	296.23																			
POOL 15	68.82	82.50	69.03	151.23	406.55	145.07	314.71																			
POOL 16	68.06	84.10	70.39	152.34	383.17	138.84	313.91																			
POOL 17	115.79	139.61	114.29	258.64	715.38	251.04	535.45																			
POOL 18	132.11	157.48	128.86	293.12	830.00	289.80	608.81																			
POOL 19	130.89	153.84	128.27	284.76	802.33	282.92	596.06																			
POOL 20	67.32	90.00	69.97	165.36	408.54	143.02	328.81																			
POOL 21	55.49	74.86	57.40	137.92	341.41	118.84	273.09																			
POOL 22	41.72	50.80	41.83	93.43	250.56	88.75	192.98																			
POOL 23	21.34	27.86	22.35	50.71	123.61	44.10	102.02																			
POOL 24	39.34	45.92	38.71	84.71	237.88	84.39	178.11																			
POOL 25	31.53	34.35	31.25	71.02	194.72	68.30	146.51																			
POOL 26	31.66	34.04	32.30	69.07	179.38	65.00	143.95																			
POOL 27	46.53	106.57	97.05	189.78	490.75	184.95	408.89																			
POOL 28	147.74	274.34	205.45	514.69	1264.76	413.49	1004.64																			

GROWTH RATES APPLIED TO POOLS BY ACTIVITIES BY YEAR

YEAR	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
POOL 1	24.85	18.38	4.35	32.81	218.66	64.96	42.59																		
POOL 2	25.82	19.51	4.40	34.59	226.92	56.06	43.59																		
POOL 3	23.94	17.30	4.34	31.11	211.31	75.09	41.03																		
POOL 4	19.44	11.53	4.30	22.16	173.30	131.40	38.09																		
POOL 5	166.23	227.04	180.74	430.61	1006.91	352.49	737.46																		
POOL 6	102.91	237.42	175.42	204.00	747.11	176.55	423.71																		
POOL 7	40.68	53.71	43.71	101.82	244.82	86.16	176.86																		
POOL 8	48.75	67.93	52.54	130.05	308.92	106.20	220.43																		
POOL 9	40.96	54.24	43.68	103.36	252.34	88.03	179.09																		
POOL 10	57.78	74.87	60.38	143.74	366.19	126.67	250.86																		
POOL 11	50.23	66.36	52.23	128.26	328.46	112.17	221.66																		
POOL 12	48.75	144.94	92.03	185.11	342.32	84.55	201.10																		
POOL 13	32.72	47.69	35.71	91.52	211.26	71.86	152.29																		
POOL 14	74.95	94.97	77.40	182.75	477.81	165.22	321.77																		
POOL 15	79.90	101.95	83.81	194.66	493.76	172.59	342.43																		
POOL 16	79.63	104.68	86.14	197.44	468.41	166.34	344.03																		
POOL 17	135.12	173.41	139.50	334.61	873.04	300.14	585.58																		
POOL 18	153.92	195.37	157.03	374.77	1011.71	346.00	665.16																		
POOL 19	152.27	190.51	156.04	367.34	976.70	337.33	649.97																		
POOL 20	77.62	110.53	84.39	211.53	492.88	168.99	355.46																		
POOL 21	64.01	92.07	69.53	176.65	411.91	140.44	295.50																		
POOL 22	47.48	61.57	49.83	117.90	297.76	103.38	205.02																		
POOL 23	24.37	33.85	26.70	64.15	147.42	51.56	109.14																		
POOL 24	45.31	56.22	46.44	104.03	244.14	89.45	192.00																		
POOL 25	36.83	47.60	38.14	91.81	237.97	81.76	160.22																		
POOL 26	38.30	48.73	40.91	91.96	225.09	80.19	162.47																		
POOL 27	110.34	134.24	114.64	244.60	605.04	222.44	451.54																		
POOL 28	217.83	152.22	257.64	680.92	1593.12	534.25	1124.28																		

GROWTH RATES APPLIED TO POOLS BY ACTIVITIES BY YEAR

YEAR	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
POOL 1	27.99	21.53	5.14	38.65	255.22	80.02	45.67																	
POOL 2	29.14	22.95	5.19	41.95	265.40	69.03	46.77																	
POOL 3	26.93	20.17	5.11	37.45	245.88	91.79	44.73																	
POOL 4	22.15	13.78	5.05	27.23	203.88	151.06	40.85																	
POOL 5	190.33	273.15	214.29	533.31	1196.57	411.97	799.37																	
POOL 6	114.86	285.17	206.52	345.18	874.08	203.83	455.16																	
POOL 7	45.97	63.77	51.19	124.39	286.63	99.28	189.14																	
POOL 8	54.95	80.38	61.36	158.32	360.49	122.01	234.98																	
POOL 9	46.00	63.84	50.81	125.15	293.07	100.70	188.02																	
POOL 10	64.91	88.18	70.24	174.17	425.72	145.01	266.32																	
POOL 11	56.26	78.00	60.59	155.12	381.12	128.12	234.79																	
POOL 12	54.72	170.11	106.90	224.61	308.83	96.88	213.41																	
POOL 13	36.99	56.63	41.81	111.84	247.53	82.85	162.92																	
POOL 14	85.32	113.42	91.23	224.62	563.65	191.82	346.38																	
POOL 15	91.33	122.26	99.21	240.19	584.51	241.12	378.09																	
POOL 16	92.53	127.46	103.67	247.32	563.05	196.94	377.88																	
POOL 17	156.56	210.98	167.46	418.88	1047.63	354.53	641.84																	
POOL 18	179.15	238.43	189.29	474.08	1219.82	410.43	732.16																	
POOL 19	176.69	231.90	187.47	460.17	1174.28	399.19	713.15																	
POOL 20	88.82	132.85	100.05	261.64	584.28	197.16	384.89																	
POOL 21	74.36	112.56	83.73	222.26	486.06	166.38	325.21																	
POOL 22	54.53	74.35	59.38	146.43	353.52	120.89	223.72																	
POOL 23	28.36	41.31	32.19	80.54	177.36	61.10	120.02																	
POOL 24	53.52	68.47	56.97	137.76	350.18	119.79	214.45																	
POOL 25	44.27	59.86	47.19	118.87	296.58	100.29	181.87																	
POOL 26	46.46	61.88	51.63	120.04	281.52	98.91	185.98																	
POOL 27	127.14	164.34	141.74	315.12	730.65	242.72	404.23																	
POOL 28	241.34	412.44	316.13	860.70	1988.04	644.15	1249.71																	

CONVERSION TO VISITOR DAYS

Conversion Factor
(Actual Days to Visitor Days)

River, Urban	0.963
Lake	0.494
River, Rural	0.581

CONVERSION RATES TO VISITOR DAYS BY POOLS BY ACTIVITIES BY YEAR

YEAR	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
POOL 1	14.71	8.50	2.07	12.18	107.13	28.43	31.28																					
POOL 2	15.14	8.92	2.09	12.11	110.45	26.52	31.88																					
POOL 3	14.34	8.13	2.07	11.71	104.50	30.86	30.98																					
POOL 4	11.26	5.04	2.07	7.46	82.96	70.10	27.84																					
POOL 5	56.40	59.00	51.20	90.38	283.58	108.82	316.82																					
POOL 6	10.44	52.04	43.45	54.11	186.74	40.40	159.94																					
POOL 7	14.52	14.56	12.91	22.31	72.31	27.86	79.37																					
POOL 8	17.54	14.67	15.69	28.92	92.51	34.77	100.22																					
POOL 9	14.94	14.20	13.24	23.44	76.90	29.88	82.86																					
POOL 10	21.10	20.90	18.24	32.45	111.06	41.98	115.65																					
POOL 11	18.54	14.69	15.98	29.21	100.46	37.53	103.17																					
POOL 12	15.31	34.99	23.99	35.44	88.67	24.02	79.64																					
POOL 13	11.81	13.11	10.67	20.33	63.08	23.48	69.19																					
POOL 14	26.55	25.66	22.74	39.59	139.82	52.94	143.58																					
POOL 15	28.39	27.56	24.61	42.53	144.71	55.35	152.89																					
POOL 16	27.84	28.00	24.95	42.72	136.17	52.81	151.95																					
POOL 17	47.44	46.57	40.65	72.65	254.30	95.61	259.69																					
POOL 18	54.46	52.73	46.05	82.64	296.38	118.80	296.61																					
POOL 19	54.08	51.63	45.95	80.44	286.86	108.44	290.93																					
POOL 20	28.22	30.62	25.43	47.36	148.14	55.60	162.75																					
POOL 21	23.64	25.85	21.24	46.12	126.12	47.04	137.33																					
POOL 22	18.39	18.16	15.96	28.13	95.86	36.36	100.44																					
POOL 23	9.36	9.97	8.44	15.30	47.23	18.01	53.06																					
POOL 24	17.22	16.33	14.06	25.39	90.34	34.30	92.11																					
POOL 25	13.52	13.39	11.62	20.88	72.36	27.10	74.32																					
POOL 26	12.65	12.48	11.17	19.14	63.06	24.32	68.54																					
POOL 27	40.45	36.24	35.93	54.11	170.50	72.77	203.66																					
POOL 28	80.52	94.08	73.16	147.05	450.05	164.18	489.89																					

CONVERSION RATES TO VISITOR DAYS BY POOLS BY ACTIVITIES BY YEAR

YEAR	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
POOL 1	17.67	11.47	2.73	18.36	139.89	37.81	34.45																				
POOL 2	18.26	12.06	2.72	19.21	144.45	32.72	35.16																				
POOL 3	17.16	10.91	2.72	17.57	136.01	43.80	33.96																				
POOL 4	13.80	8.89	2.72	11.97	108.91	89.06	30.68																				
POOL 5	69.10	81.19	138.75	375.49	138.26	352.11																					
POOL 6	37.17	72.76	56.96	81.51	265.75	60.66	176.00																				
POOL 7	17.47	14.83	16.89	33.90	94.59	34.98	87.25																				
POOL 8	21.04	25.30	20.44	43.70	120.41	43.45	109.65																				
POOL 9	17.87	20.44	17.14	35.14	90.51	34.40	90.13																				
POOL 10	25.15	28.14	23.56	48.74	143.75	52.18	125.80																				
POOL 11	22.01	25.09	20.62	43.72	129.62	46.48	111.83																				
POOL 12	18.19	46.83	30.95	53.71	114.75	29.80	86.38																				
POOL 13	14.04	17.68	13.84	30.60	81.84	29.24	75.40																				
POOL 14	31.84	34.80	29.64	60.35	182.50	66.31	157.30																				
POOL 15	33.84	37.21	32.02	64.22	188.44	69.18	167.17																				
POOL 16	33.42	37.95	32.55	64.58	177.41	66.09	166.40																				
POOL 17	57.03	63.19	53.04	109.96	331.95	119.81	284.66																				
POOL 18	65.27	71.46	59.98	124.91	386.18	138.71	324.65																				
POOL 19	64.71	69.84	59.75	121.41	373.37	135.46	317.91																				
POOL 20	33.51	41.13	32.81	70.96	191.39	68.94	176.53																				
POOL 21	27.86	34.48	27.22	58.48	141.51	57.82	147.86																				
POOL 22	21.24	23.75	20.05	41.04	120.29	43.81	106.02																				
POOL 23	10.82	12.99	10.67	22.22	59.16	21.69	55.88																				
POOL 24	19.85	21.27	18.38	36.86	113.02	41.23	96.91																				
POOL 25	15.70	17.56	14.66	30.54	91.30	32.94	78.76																				
POOL 26	15.32	16.99	14.72	29.01	82.33	30.60	75.44																				
POOL 27	47.35	48.52	45.75	88.98	228.46	89.35	219.41																				
POOL 28	96.61	126.13	94.99	219.89	585.38	205.40	532.80																				

CONVERSION RATES TO VISITOR DAYS BY POOLS BY ACTIVITIES BY YEAR

YEAR	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
POOL 1	20.83	14.60	3.45	24.95	175.18	49.61	37.87																			
POOL 2	21.59	15.42	3.48	26.21	181.35	42.90	38.71																			
POOL 3	20.14	13.80	3.44	23.74	149.72	57.37	37.24																			
POOL 4	16.14	4.06	3.42	16.55	137.50	107.24	33.77																			
POOL 5	82.64	105.87	85.92	195.70	477.58	170.83	390.70																			
POOL 6	43.91	94.35	71.44	114.72	306.40	73.72	142.78																			
POOL 7	20.51	25.40	21.06	45.22	117.95	42.39	95.04																			
POOL 8	24.67	37.27	25.41	54.72	149.52	52.47	118.98																			
POOL 9	28.42	25.93	21.23	47.44	122.85	43.72	97.23																			
POOL 10	24.35	35.75	29.32	65.90	177.99	62.83	136.03																			
POOL 11	25.60	31.77	25.45	54.95	160.04	55.80	120.53																			
POOL 12	21.14	59.14	38.17	72.37	141.75	35.76	99.03																			
POOL 13	16.51	22.59	17.23	41.42	101.89	35.38	81.96																			
POOL 14	37.58	44.73	37.12	82.41	228.88	80.82	172.11																			
POOL 15	39.94	47.93	40.10	87.84	234.20	84.29	182.85																			
POOL 16	39.54	44.84	40.49	88.51	222.62	80.66	182.38																			
POOL 17	47.27	41.11	66.40	150.27	415.63	145.85	311.10																			
POOL 18	76.76	41.50	74.86	170.30	482.23	169.37	353.84																			
POOL 19	76.05	89.38	74.52	165.45	466.15	164.38	346.32																			
POOL 20	39.12	52.29	40.65	96.07	237.36	83.09	191.04																			
POOL 21	39.24	43.50	33.46	80.13	194.36	69.05	158.67																			
POOL 22	24.24	29.51	24.30	54.28	145.57	51.56	112.12																			
POOL 23	12.40	16.19	12.48	29.46	71.82	25.62	59.28																			
POOL 24	22.89	26.69	22.49	49.32	138.21	49.03	103.48																			
POOL 25	18.32	22.28	18.15	41.26	113.13	39.68	85.12																			
POOL 26	18.40	22.11	18.77	40.13	104.22	37.76	83.63																			
POOL 27	54.92	61.92	56.38	114.26	285.13	104.44	237.57																			
POOL 28	114.89	161.74	119.49	300.20	737.44	251.98	583.70																			

CONVERSION RATES TO VISITOR DAYS BY POOLS BY ACTIVITIES BY YEAR

YEAR	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
P00L 1	23.93	17.70	4.19	31.59	210.57	62.55	41.02																					
P00L 2	24.86	18.79	4.23	33.31	218.52	53.98	41.98																					
P00L 3	23.18	16.46	4.14	20.96	203.49	12.31	40.28																					
P00L 4	18.77	11.10	4.14	21.34	166.89	126.54	36.68																					
P00L 5	96.54	131.91	105.01	250.19	585.02	204.79	428.47																					
P00L 6	50.84	117.28	86.66	140.10	369.07	87.21	200.31																					
P00L 7	23.63	31.21	25.40	59.16	142.24	50.06	102.76																					
P00L 8	28.32	39.47	30.53	75.56	179.48	61.70	128.07																					
P00L 9	23.40	31.41	25.34	60.05	144.61	51.15	104.05																					
P00L 10	33.57	41.50	35.08	83.51	212.76	73.60	145.75																					
P00L 11	29.14	38.56	30.35	74.52	190.83	65.17	128.79																					
P00L 12	24.08	31.60	25.47	61.45	169.10	41.77	99.34																					
P00L 13	19.01	27.71	20.74	53.17	122.74	41.75	88.48																					
P00L 14	43.54	55.18	44.97	106.18	277.61	95.99	186.95																					
P00L 15	46.42	59.23	48.69	113.10	286.87	100.27	198.95																					
P00L 16	46.26	60.82	50.05	114.71	272.15	96.64	199.88																					
P00L 17	78.51	100.75	81.05	194.41	507.23	174.38	340.22																					
P00L 18	89.43	113.51	91.23	220.07	587.80	201.03	386.46																					
P00L 19	88.47	110.69	90.66	213.42	567.46	195.99	377.63																					
P00L 20	45.10	64.22	49.03	127.90	286.36	98.18	206.52																					
P00L 21	37.14	53.49	40.40	102.63	239.32	81.60	171.68																					
P00L 22	27.58	35.77	28.95	68.50	173.00	60.06	119.58																					
P00L 23	14.16	19.47	15.52	37.27	85.65	29.96	63.41																					
P00L 24	26.33	32.47	27.06	62.76	166.26	57.78	111.55																					
P00L 25	21.40	27.65	22.16	53.34	138.26	47.51	93.09																					
P00L 26	22.25	28.31	23.77	53.43	130.78	46.59	94.39																					
P00L 27	64.13	78.80	68.85	143.01	352.06	129.26	262.36																					
P00L 28	138.18	204.64	149.63	395.62	925.60	310.40	653.21																					

CONVERSION RATES TO VISITOR DAYS BY POOLS BY ACTIVITIES BY YEAR

YEAR	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
POOL 1	26.96	20.73	4.95	38.18	245.78	77.06	43.98																	
POOL 2	28.07	22.10	5.00	40.40	255.58	66.47	45.04																	
POOL 3	25.94	19.42	4.92	36.86	236.78	88.40	43.00																	
POOL 4	21.33	13.27	4.86	26.22	196.33	145.47	39.34																	
POOL 5	110.54	154.70	124.50	309.86	695.21	279.36	464.44																	
POOL 6	57.73	140.87	102.02	170.52	431.00	100.69	224.85																	
POOL 7	26.71	37.05	27.74	72.27	166.53	57.68	109.89																	
POOL 8	31.42	46.70	35.65	91.99	209.44	70.89	136.52																	
POOL 9	26.72	37.06	27.72	72.71	170.27	58.51	110.40																	
POOL 10	37.71	51.23	40.81	101.19	247.34	84.25	154.73																	
POOL 11	32.69	45.32	35.20	90.13	221.43	74.44	136.41																	
POOL 12	27.83	40.03	52.81	110.06	197.02	47.84	105.42																	
POOL 13	21.49	32.90	24.29	64.98	143.81	48.14	94.65																	
POOL 14	49.57	65.90	53.00	130.51	327.48	111.45	201.25																	
POOL 15	53.04	71.03	53.64	139.55	339.60	116.05	215.02																	
POOL 16	53.76	74.05	60.23	143.70	327.13	114.42	219.43																	
POOL 17	90.96	122.58	97.30	243.37	608.68	205.98	372.91																	
POOL 18	104.09	138.64	109.98	276.60	708.72	238.58	425.30																	
POOL 19	102.66	134.73	108.92	267.36	682.26	231.93	414.34																	
POOL 20	51.61	77.19	58.13	152.01	339.47	114.55	223.62																	
POOL 21	43.20	65.40	48.65	129.13	288.21	96.47	188.05																	
POOL 22	31.68	43.20	34.50	85.07	205.39	70.24	129.98																	
POOL 23	16.48	24.00	18.70	46.80	103.04	35.50	69.73																	
POOL 24	31.10	40.48	33.18	80.84	203.46	69.60	124.60																	
POOL 25	25.72	36.78	27.53	69.07	172.31	58.27	105.66																	
POOL 26	27.00	35.95	29.88	69.74	163.56	57.47	108.05																	
POOL 27	73.84	95.46	82.38	193.09	424.51	152.64	288.31																	
POOL 28	163.44	251.36	182.62	500.06	1131.01	374.25	726.08																	

EXPANSION OF VISITOR DAYS FOR PERSONS COMING
FROM BEYOND 75 MILES

Expansion Factor
(Factor Times Visitor Days)

River, Urban	1.166
Lake	1.360
River, Rural	1.322

EXPANDED VISITOR DAYS FOR MORE DISTANT ORIGINS BY POOL BY ACTIVITY BY YEAR
YFAM 1

POOL 1	17.15	9.91	2.41	14.20	124.91	33.15	36.47
POOL 2	17.70	10.40	2.43	14.82	128.78	28.59	37.18
POOL 3	16.72	9.48	2.41	13.66	121.85	38.31	36.02
POOL 4	13.13	5.88	2.42	9.16	96.73	81.73	32.46
POOL 5	75.04	74.00	47.68	119.48	374.94	143.87	418.83
POOL 6	41.97	72.02	59.10	73.59	256.68	65.83	217.59
POOL 7	19.20	19.25	17.07	29.50	95.59	36.84	104.93
POOL 8	23.26	24.69	20.74	38.23	122.29	45.07	132.50
POOL 9	19.81	20.09	17.50	30.99	101.66	38.70	109.54
POOL 10	27.89	27.63	24.14	42.90	146.82	55.49	152.88
POOL 11	24.52	24.71	21.12	38.61	132.80	49.61	136.39
POOL 12	20.82	47.59	32.63	48.74	120.60	32.66	108.31
POOL 13	15.61	17.33	14.11	26.88	83.39	31.04	91.47
POOL 14	35.10	33.92	30.06	52.73	184.84	69.90	189.81
POOL 15	37.41	36.43	32.53	56.22	191.31	73.18	202.12
POOL 16	36.81	37.01	32.98	56.48	180.02	69.81	200.88
POOL 17	42.70	61.57	63.73	96.05	336.19	124.39	343.31
POOL 18	72.00	69.71	60.87	109.24	391.71	146.58	392.12
POOL 19	71.50	68.25	60.75	106.35	379.23	143.36	384.61
POOL 20	37.30	40.48	33.61	62.62	195.84	73.51	215.15
POOL 21	31.26	34.19	28.08	53.03	166.73	62.19	181.55
POOL 22	24.31	24.00	21.09	37.19	126.72	48.07	132.79
POOL 23	12.37	13.19	11.23	20.23	62.43	23.81	70.15
POOL 24	22.76	21.59	19.34	33.56	119.43	45.35	121.77
POOL 25	17.87	17.70	15.36	27.60	95.66	35.94	98.25
POOL 26	16.72	16.50	14.76	25.31	83.36	32.15	90.61
POOL 27	51.47	47.61	47.50	71.54	235.94	96.21	269.24
POOL 28	106.45	124.37	96.73	106.40	596.97	217.09	647.64

EXPANDED VISITOR DAYS FOR HOME DISTANT ORIGINS BY POOL BY ACTIVITY BY YEAR
YEAR 2

POOL 1	20.60	13.37	3.18	21.41	163.12	44.09	40.17
POOL 2	21.29	14.07	3.21	22.40	168.43	39.15	40.99
POOL 3	20.01	12.72	3.17	20.49	158.58	51.07	39.59
POOL 4	15.86	8.84	3.17	13.96	126.99	102.68	35.78
POOL 5	91.35	107.33	89.48	107.47	466.40	182.78	465.49
POOL 6	50.55	98.96	77.46	110.86	334.22	82.50	239.36
POOL 7	23.04	26.22	22.33	44.81	125.05	46.24	115.35
POOL 8	27.87	33.45	27.02	57.77	159.18	57.45	144.96
POOL 9	23.63	27.05	22.68	46.52	131.55	48.12	119.15
POOL 10	33.24	37.20	31.28	64.43	190.04	68.98	166.30
POOL 11	29.10	33.17	27.25	57.80	171.36	61.45	147.83
POOL 12	24.73	63.69	42.10	73.05	156.07	40.53	117.47
POOL 13	18.62	23.38	18.29	40.46	108.19	38.65	99.67
POOL 14	42.10	44.88	39.18	70.79	241.26	87.66	207.95
POOL 15	44.80	49.12	42.33	86.90	249.15	91.46	221.00
POOL 16	44.18	50.17	43.03	85.37	234.54	87.37	219.98
POOL 17	75.30	81.54	70.12	145.37	438.84	158.38	376.32
POOL 18	86.29	94.46	79.30	165.14	510.53	183.37	429.19
POOL 19	85.54	92.33	78.99	160.50	493.59	179.08	420.27
POOL 20	44.30	54.37	43.38	93.81	253.02	91.14	233.37
POOL 21	36.83	45.59	35.99	78.90	213.51	76.44	195.47
POOL 22	28.08	31.39	26.51	54.25	159.03	57.92	140.15
POOL 23	14.38	17.18	14.11	28.38	78.21	28.67	73.88
POOL 24	26.25	28.12	24.30	48.73	149.41	54.50	128.11
POOL 25	20.75	21.22	19.19	40.38	120.70	43.54	104.12
POOL 26	20.26	22.44	19.44	38.35	108.84	40.45	98.74
POOL 27	62.59	64.16	60.69	107.07	303.34	118.12	290.07
POOL 28	127.11	166.76	129.58	230.69	773.87	271.54	704.36

EXPANDED VISITOR DAYS FOR MORE DISTANT ORIGINS BY POOL BY ACTIVITY BY YEAR

YEAR	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
POOL 1	24.29	17.02	4.02	29.09	204.26	57.85	44.16																			
POOL 2	25.17	17.98	4.06	30.56	211.44	50.02	45.13																			
POOL 3	23.51	16.00	4.01	27.70	197.89	46.89	43.43																			
POOL 4	18.86	10.44	3.99	19.29	160.33	125.04	39.34																			
POOL 5	109.24	139.94	113.50	254.75	631.36	225.83	516.51																			
POOL 6	59.71	128.32	97.21	150.04	416.70	100.26	262.18																			
POOL 7	27.11	33.57	27.84	61.10	155.93	56.04	125.65																			
POOL 8	32.61	42.44	33.50	78.42	187.64	69.36	157.29																			
POOL 9	27.53	34.28	24.06	62.74	162.41	57.80	128.54																			
POOL 10	38.81	47.26	38.76	87.12	235.30	83.06	179.83																			
POOL 11	33.84	42.00	33.45	77.93	211.57	73.76	159.35																			
POOL 12	28.75	40.43	51.91	98.42	192.78	48.64	126.53																			
POOL 13	21.83	29.86	22.77	55.02	134.69	46.78	108.35																			
POOL 14	49.64	59.13	49.87	109.21	302.88	104.84	322.53																			
POOL 15	52.86	63.37	53.02	116.16	312.26	111.43	241.72																			
POOL 16	52.27	64.60	54.06	117.01	294.31	106.64	241.11																			
POOL 17	88.94	107.23	87.79	198.44	549.47	192.82	411.27																			
POOL 18	101.47	120.96	98.97	225.14	637.51	222.59	467.77																			
POOL 19	100.54	118.16	98.52	218.72	616.25	217.31	457.84																			
POOL 20	51.71	69.13	53.74	127.01	313.80	109.85	252.56																			
POOL 21	42.62	57.50	44.24	105.93	262.23	91.28	209.76																			
POOL 22	32.04	39.02	32.13	71.76	192.45	68.17	148.22																			
POOL 23	16.39	21.40	17.16	38.95	94.94	33.87	78.36																			
POOL 24	30.26	35.27	29.73	65.07	182.71	64.82	136.80																			
POOL 25	24.22	29.46	24.00	54.55	149.56	52.46	112.53																			
POOL 26	24.32	29.23	24.81	53.05	137.74	49.92	110.56																			
POOL 27	12.61	11.86	10.54	16.77	376.94	142.06	314.06																			
POOL 28	14.14	21.42	17.36	34.46	974.90	313.11	771.65																			

EXPANDED VISITOR DAYS FOR MORE DISTANT ORIGINS BY POOL BY ACTIVITY BY YEAR

YEAR	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
POOL 1	27.90	20.64	4.89	36.84	245.52	72.04	47.83																		
POOL 2	28.99	21.91	4.94	38.84	254.79	62.04	48.04																		
POOL 3	26.93	19.42	4.47	34.94	237.27	84.32	46.97																		
POOL 4	21.89	12.94	4.83	24.88	194.59	147.55	42.76																		
POOL 5	127.00	174.99	138.82	338.75	773.39	270.74	566.43																		
POOL 6	69.14	154.51	117.86	190.80	501.94	118.61	284.67																		
POOL 7	31.24	41.25	33.58	78.20	188.04	66.18	135.84																		
POOL 8	37.44	52.18	40.36	99.89	237.28	81.57	169.31																		
POOL 9	31.46	41.66	33.55	79.39	193.82	67.61	137.56																		
POOL 10	44.38	57.51	46.38	110.40	281.26	97.29	192.68																		
POOL 11	38.58	58.97	48.12	98.51	252.28	86.16	170.25																		
POOL 12	32.75	97.38	61.83	124.37	229.98	56.80	135.11																		
POOL 13	25.13	36.63	27.42	70.29	162.26	55.19	116.97																		
POOL 14	57.57	72.95	59.45	148.37	367.00	126.48	247.15																		
POOL 15	61.37	78.31	64.37	149.51	379.25	132.56	263.01																		
POOL 16	61.16	80.40	66.16	151.65	359.78	127.76	264.24																		
POOL 17	103.78	131.90	107.15	257.01	678.56	238.53	449.70																		
POOL 18	118.22	150.06	120.61	290.93	777.08	265.76	510.90																		
POOL 19	116.96	146.33	119.85	282.15	750.18	259.10	499.23																		
POOL 20	59.62	84.98	64.82	142.47	378.57	129.88	273.02																		
POOL 21	49.17	70.71	53.41	135.68	316.38	107.87	226.97																		
POOL 22	36.47	47.29	38.28	90.55	228.70	79.40	158.09																		
POOL 23	14.72	26.88	20.51	48.27	113.23	38.40	83.82																		
POOL 24	34.80	43.18	35.78	82.97	219.79	76.39	147.47																		
POOL 25	24.24	36.56	29.29	70.52	182.74	62.80	123.06																		
POOL 26	29.62	37.43	31.42	70.43	172.89	61.59	124.74																		
POOL 27	44.78	104.11	91.15	141.71	465.42	170.89	346.84																		
POOL 28	142.87	279.33	197.81	423.01	1221.64	410.35	863.54																		

EXPANDED VISITOR DAYS FOR MOORE DISTANT ORIGINS BY POOL BY ACTIVITY BY YEAR
YEAR 5

POOL 1	31.43	24.18	5.77	44.52	286.58	89.86	51.28
POOL 2	32.73	25.74	5.83	43.11	288.01	72.51	52.52
POOL 3	30.24	22.64	5.74	42.05	276.08	103.07	50.23
POOL 4	24.87	15.44	5.67	30.58	228.93	169.61	45.87
POOL 5	146.19	200.80	144.40	409.43	919.07	314.43	413.99
POOL 6	78.51	191.59	138.75	231.00	587.24	136.94	305.79
POOL 7	35.31	48.98	39.31	95.54	220.16	76.26	145.28
POOL 8	42.20	61.73	47.13	121.40	276.89	93.71	180.49
POOL 9	35.33	49.04	39.02	96.13	225.10	77.35	145.95
POOL 10	49.86	67.73	53.95	133.78	326.98	111.38	204.56
POOL 11	43.21	54.81	46.54	119.15	282.73	98.40	180.34
POOL 12	36.76	114.28	71.82	150.91	267.95	65.07	143.38
POOL 13	28.41	43.49	32.12	85.90	190.12	63.63	125.13
POOL 14	65.53	87.12	70.07	172.53	432.93	147.31	266.05
POOL 15	70.15	93.90	76.20	186.49	448.95	154.48	284.26
POOL 16	71.07	97.90	79.63	189.97	432.47	151.27	290.09
POOL 17	121.25	162.05	128.63	321.73	804.67	272.31	482.98
POOL 18	137.61	183.29	145.39	365.67	936.92	315.40	562.36
POOL 19	135.71	174.12	144.00	353.45	901.95	306.61	547.76
POOL 20	68.22	102.04	76.85	204.86	448.78	151.44	295.63
POOL 21	57.11	86.46	66.31	170.71	381.01	127.79	249.79
POOL 22	41.88	57.11	45.61	112.47	271.53	92.85	171.84
POOL 23	21.78	31.73	24.73	61.86	136.22	46.93	92.19
POOL 24	41.11	53.51	43.76	105.81	268.97	92.01	164.72
POOL 25	36.00	45.98	36.40	91.30	227.79	77.03	139.69
POOL 26	35.69	47.54	39.50	92.20	216.23	75.97	142.85
POOL 27	37.68	126.23	108.21	267.04	561.20	201.79	381.15
POOL 28	216.17	432.30	261.24	661.08	1496.25	499.76	959.88

TOTAL VISITATION TO CORPS PROJECTS
BY POOL, BY YEAR

TOTAL VISITS (000)

	1940	1945	1949	1955	2000
P00L 1	234.21	305.94	340.64	456.56	533.61
P00L 2	239.41	308.54	344.34	461.36	539.44
P00L 3	234.45	305.64	379.52	454.72	530.05
P00L 4	241.51	306.47	377.33	449.45	521.00
P00L 5	1277.44	1616.25	1991.25	2342.19	2779.69
P00L 6	786.74	993.90	1214.42	1442.53	1670.72
P00L 7	322.34	403.04	447.25	574.34	660.84
P00L 8	407.64	507.49	611.60	710.82	823.75
P00L 9	334.29	414.72	501.36	545.06	667.91
P00L 10	477.76	591.44	710.15	829.91	944.24
P00L 11	427.77	527.97	632.11	736.88	840.28
P00L 12	411.34	517.64	627.46	738.22	850.16
P00L 13	274.42	347.24	419.31	493.90	568.81
P00L 14	506.44	743.94	904.05	1071.38	1241.56
P00L 15	629.20	782.95	950.82	1128.38	1312.43
P00L 16	614.00	764.65	930.00	1111.15	1312.34
P00L 17	1044.04	1447.04	1634.14	1952.01	2302.62
P00L 18	1242.24	1544.24	1474.40	2233.55	2646.63
P00L 19	1214.03	1510.31	1427.33	2173.79	2567.59
P00L 20	644.51	813.39	977.40	1153.19	1343.91
P00L 21	557.02	682.72	413.56	940.19	1137.19
P00L 22	414.14	497.33	543.74	674.78	793.29
P00L 23	213.40	255.72	301.04	341.14	415.44
P00L 24	343.44	459.42	544.65	640.39	769.49
P00L 25	304.34	372.09	446.74	533.30	652.20
P00L 26	274.42	340.64	420.64	524.17	649.97
P00L 27	421.54	1005.01	1207.41	1451.90	1719.00
P00L 28	1241.54	2447.69	3006.17	3671.55	4401.44

END

FILMED

6-83

DTIC