

RECREATIONAL BOATING IN DADE COUNTY

1975-76

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SEA GRANT
SPECIAL REPORT NO. 9
MARCH, 1977

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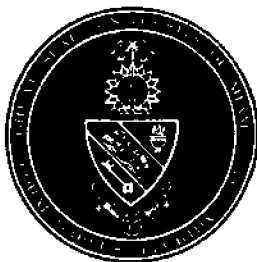
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SPECIAL REPORT NO. 9
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The University of Miami staff comprised C. Bruce Austin, principal investigator; Linda D. Siefert, J. Connor Davis, Robert D. Brugger, full-time research assistants; and Marwan Hujeij, part-time research assistant. In addition, there was valuable assistance and advice from numerous faculty members and students at the University of Miami. Francis Williams, Chairman, Division of Biology and Living Resources, Rosenstiel School of Marine and Atmospheric Science, provided office space and secretarial services for the study. Graduate students Terje Gustafson, Eric Eimstad, Mark Ward, and David K. Kittrell assisted in field work and data processing.

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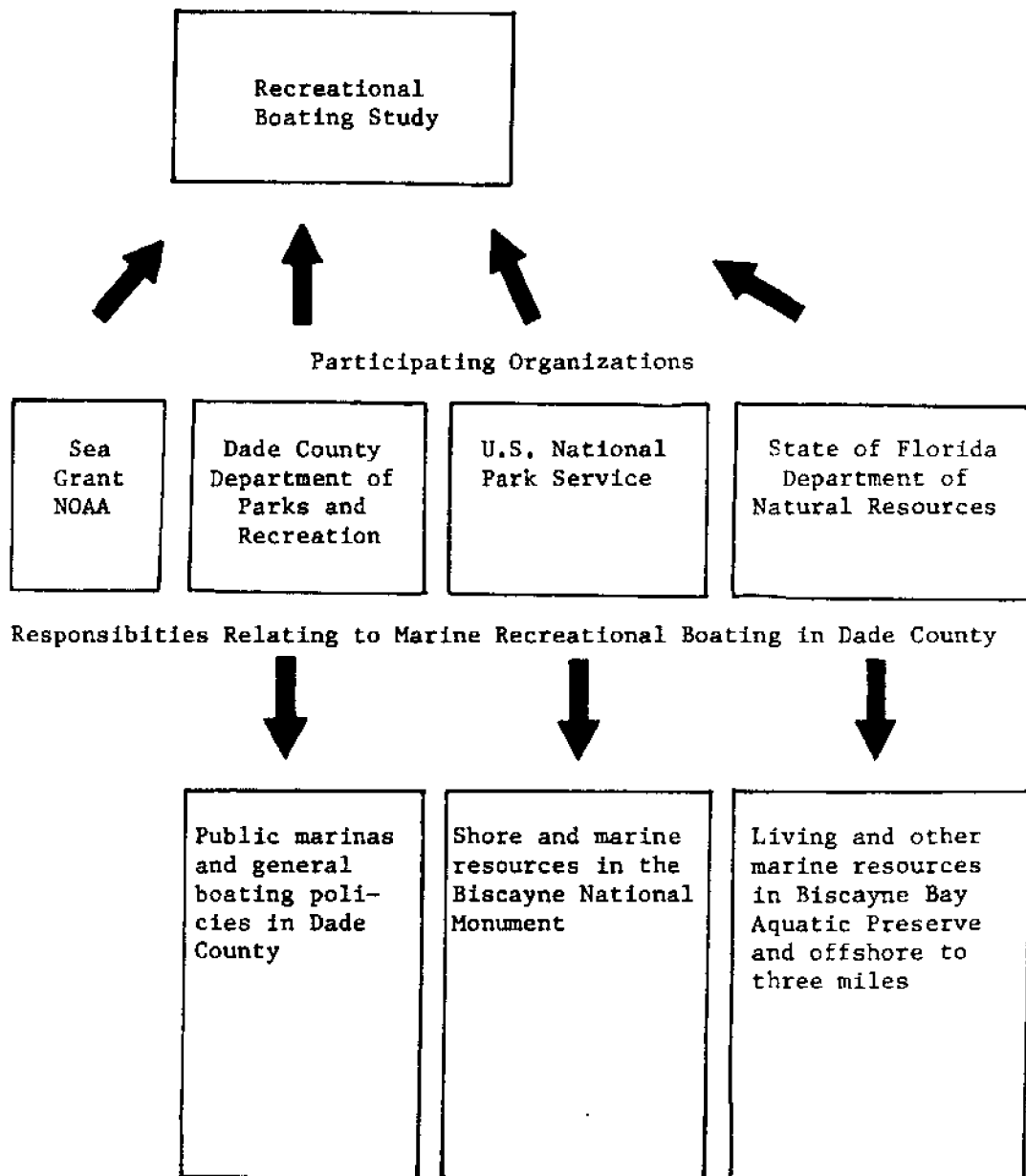


Figure 1. Organizations participating in the recreational boating study.

INTRODUCTION

Objectives of the Study

A study of recreational boating in Dade County formally began with a meeting between C. Bruce Austin from the University of Miami Institutional Sea Grant Program and Arthur H. Peavy, Director of Dade County Department of Parks and Recreation. After numerous discussions between University of Miami staff and County officials the consensus was that there were a number of important unresolved policy issues related to marine recreation. The most immediate concern related to plans for developing marinas at Chapman Field and Black Point and expansion of Homestead Bayfront Park Marina.

The research goal was to provide a comprehensive profile of marine recreational boating in Dade County. There were two information criteria. The study had to be broad enough to provide an overall "snapshot" of boating incorporating the baseline data necessary for future public policy decisions. At the same time, more specific types of information were required for planning and design of new marina facilities.

Research Design

The basic research design incorporates the following factors:

1. total boating trips
2. relative amounts of boating by different offshore activities
3. three spacial dimensions: shore residence areas, marina departure sites, and to offshore destination areas

4. three time dimensions: seasonal, day of week, and time of day.

Data Base

The data used in this study came from both existing sources and from original observations and samplings.

Existing data:

1. 1975-76 State of Florida registered boats
2. 1970 U. S. census data

Original data:

3. Berthed boat census
4. Marina operators telephone interview
5. Marina site interviews of boaters
6. Questionnaires dispersed with site interviews
7. Questionnaires mailed to registered boaters
8. Aerial offshore boat census

Sources of Existing Data

The 1975-76 data on registered boaters was obtained through the courtesy of the State of Florida Department of Natural Resources. The list contains 346,353 boats statewide, 35,923 boats in Dade County, and is maintained as a computer disk file. The 1970 U. S. census data organized by zip codes was obtained from Florida State University.

Sampling for Original Data

An in situ survey of berthed boats in Dade County was conducted from a small boat between November 1 and December 15, 1975.

The entire population of marina operators was interviewed by telephone during May and June, 1976.

Owners of trailerable and wet berthed boats were interviewed upon

their return at five County marinas (Haulover, North Bay, Crandon, Matheson, Homestead) during three six-week intervals (January 15-February 28, April 15-May 30, June 15-August 1). Sampling days were not randomly chosen or distributed according to the amounts of activity at each marina. Given limited field staff, the objective was to cover all marinas at least one weekend day per week and each weekday at least once during the six-week cycle. A total of 4,275 interviews were conducted during the study. Estimates derived by aggregating over marinas (which are not common in this study) have been weighted according to the relative activity originating at each site. A "creel census" of fish caught was performed on a random sample (1977) of recreational fishermen that were interviewed at the marinas. The catch, species composition, and fish lengths were recorded.

When site interviews were conducted at the five marinas, interviewees were asked to take a written questionnaire home and return it by mail (self-addressed stamped envelope). Questionnaires were placed on all berthed boats in the county marinas in addition to dispersing them during interviews with owners of berthed boats. This resulted in 853 returns, which is a return rate in excess of thirty percent for those who agreed to complete a questionnaire.

A questionnaire similar to the one dispersed at the five County marinas during interviews was mailed to a stratified (by zip code) random (by size and type boat) sample of 1,200 registered boaters. A total of 251 questionnaires were returned, which is a return rate of 21 percent which is extremely high given that approximately 12 percent (149) of the sample had incorrect non-forwarding mailing addresses.

Aerial counts of boats at offshore areas were made between 1200 and 1400 hours from a small fixed-wing aircraft on days randomly selected from

the population of days when site interviews were conducted at the five County marinas. A list of variables recorded and exhibits of questionnaires are in Appendix I.

Spatial Delineations

The study area encompasses all of Dade County. Where boaters reside, their shore departure sites, and their offshore destinations are recorded. Land coordinates are comprised of nine zip code groups (Figure 2). There are also nine offshore destination areas (Figure 3). They were chosen according to landmarks or bottom types known to boaters where specific patterns of offshore boating activities were expected to occur. The National Monument area is further subdivided so that the destination studies conform to coordinates already in use by the National Park Service.

Seasonal Variations

Data from the registered boat file, U. S. census, berthed boat census, marine operators interviews, and the questionnaire mailed to a stratified random sample of registered boaters are not seasonally divided. Data from the site interviews, questionnaires dispersed during the site interviews, and aerial offshore boat census are recorded "seasonally." The seasonal estimates are according to "Winter" (January-March), "Spring" (April-June), "Summer" (July-September), and "Fall" (October-December).

Data Handling

All data are stored on computer disk files at the University of Miami Computer Center (Main Campus). Most data handling was accomplished through the commercial programs, Statistical Package for Social Sciences (SPSS), operating on a Univac 1106 computer. Time curves (Appendix II) used in estimating total daily boating activity were simulated on an analog computer at the Rosenstiel School of Marine and Atmospheric Science.

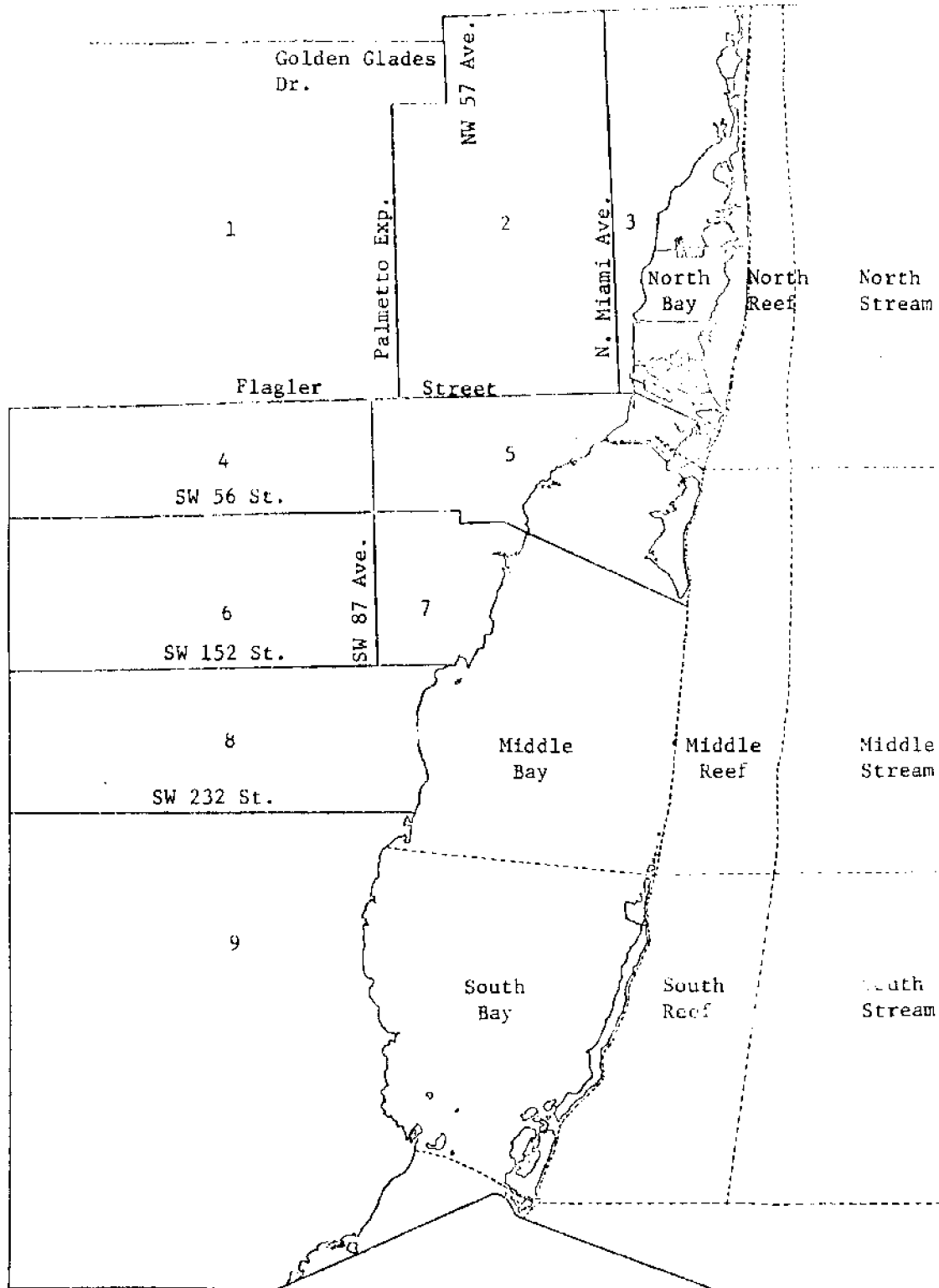


Figure 3. Shore and offshore area coordinates in Dade County.

The majority of the data is presented in the forms of frequency distributions for one variable or contingency tables for joint frequency distributions of more than one variable. Analysis of variance is not presented for estimates derived from the combination of stochastic variables.

BACKGROUND ON BOATING IN DADE COUNTY

Registered Boats

In 1975-76 (6/30/75-7/1/76) there are 346,353 boats registered in Florida. Approximately ten percent (35,923) of these boats are in Dade County (Table 1). While per capita boat ownership is lower in Dade County than some more rural counties (Table 1), Dade has the largest number of boats and per capita ownership has continuously increased (Table 2). Since 1963 there have been proportionately more boats in the 16-25 foot range with proportionately fewer boats in the less than 16 foot category. The growth in the 16-25 foot boats reflects the growing popularity of large fiberglass trailerable boats.

New boat sales are reflected by the number of boats built each year. Tables 3 and 4 indicate the years in which boats registered in 1975-76 were built, by length and type. Since these numbers are derived from the current registration list, boats built in any year that have been retired from the fleet are not included. However, it can be assumed that boats constructed since 1970 have been retired; therefore, these numbers are probably accurate estimates of local new boat sales. It is interesting to note that the fluctuations in new boat sales since 1970 (registrations of boats built since 1970) to Dade residents, follow local economic trends. There were slight declines in 1971 and 1974 (Figures 4 and 5). Since the registration list was compiled in the summer of 1975, few boats are

TABLE 1
 DISTRIBUTION OF REGISTERED BOATS IN FLORIDA, 1975

County	Total Population	Total Registered Boats	Boats per 1,000 Population
Alachua	130,000	5,172	40
Baker	12,000	526	44
Bay	95,000	7,231	76
Bradford	16,000	1,190	74
Brevard	252,000	13,068	52
Broward	850,000	21,813	26
Calhoun	8,800	748	85
Charlotte	41,000	3,652	89
Citrus	36,000	4,182	116
Clay	48,000	1,994	42
Collier	65,000	6,214	96
Columbia	30,500	1,527	50
Dade	1,442,000	35,923	25
Desoto	19,500	739	38
Dixie	6,900	553	80
Duval	580,000	19,906	34
Escambia	226,000	10,340	46
Flagler	7,100	486	68
Franklin	8,100	418	52
Gadsden	39,000	1,090	28
Gilchrist	5,400	409	76
Glades	5,100	457	90
Gulf	11,100	960	86
Hamilton	8,400	202	24
Hardee	19,100	839	44
Hendry	15,600	826	53
Hernando	27,100	1,379	51
Highlands	42,700	2,787	65
Hillsborough	602,000	21,331	35
Holmes	12,800	617	48
Indian River	46,600	2,668	57

TABLE 1 CONTINUED

Jackson	42,900	1,929	45
Jefferson	9,500	328	35
Lafayette	3,300	157	48
Lake	87,000	7,036	81
Lee	162,000	11,972	74
Leon	135,000	5,727	42
Levy	15,900	897	56
Liberty	3,900	362	93
Madison	14,400	412	29
Manatee	126,000	6,668	53
Marion	101,000	5,973	59
Martin	54,000	3,919	73
Monroe	56,000	6,667	119
Nassau	28,700	1,179	41
Okaloosa	106,000	5,999	57
Okeechobee	18,000	1,692	94
Orange	440,000	16,099	37
Osceola	38,100	1,737	46
Palm Beach	489,000	16,996	35
Pasco	136,000	5,835	43
Pinellas	680,000	20,718	30
Polk	278,000	13,598	49
Putnam	44,000	3,058	70
St. Johns	39,500	1,398	35
St. Lucie	72,000	2,797	39
Santa Rosa	48,700	3,288	68
Sarasota	165,000	10,693	.
Seminole	144,000	5,068	35
Sumter	21,500	1,607	75
Suwannee	18,600	741	40
Taylor	14,600	989	68
Union	10,200	206	20
Volusia	220,000	8,532	39
Wakulla	10,200	874	86
Walton	18,200	1,072	59

Washington	15,000	713	48
TOTAL	8,575,000	346,353	40

SOURCE: State of Florida, Department of Natural Resources, List of Registered Boat Owners (1975).

indicated as being built that year.

Table 5 and Figure 6 indicate the geographic distribution of registered boat owners in Dade County.

An in situ survey of all berths was conducted between November 1 and December 15, 1975, to determine the number, size, location, and type of water craft in Dade County which are kept in berths having direct access to salt water. This required physically visiting every berth in the county. Aerial surveys could not determine whether small boats are kept permanently in the water, see under covered dockage, determine the registry of boats, or adequately determine the sizes and types of boats.

Dade County census tracts are combined into four areas: North Bay, Miami Beach, Middle Bay, and South Bay. A fifth area, Miami River, does not follow aggregated census tracts. These classifications do not correspond to area classifications used in the rest of the study. North Bay is defined as all Dade County north of Haulover Cut. Miami Beach includes the city of Miami Beach and the communities of Bal Harbour Village, Surfside, Bay Harbor Islands, and North Bay Village. Middle Bay is defined as all the area on the mainland between Baker's Haulover Inlet and Rickenbacker Causeway, including Watson Island and that part of 79th Street Causeway which is east of North Bay Village. The Miami River includes the river up to the N.W. 36 Street salinity dam and all navigable tributaries. South Bay is defined as all the area connected with the bay south of Rickenbacker Causeway (see Figures 7-9).

TABLE 2

DADE COUNTY BOAT REGISTRATIONS BY BOAT LENGTH AND POPULATION

Year	< 16 Feet		16-25 Feet		26-39 Feet		40 Feet & Over		Total Boats	Total Population	Reg. Boats Population
	Number	Percent	Number	Percent	Number	Percent	Number	Percent			
1963	1039	61.8	5531	33.1	642	3.8	203	1.2	16695	1065000	1.5
1965	11423	58.0	7444	37.8	761	3.8	79	0.4	19707	1097200	1.8
1967	13313	55.0	9513	39.3	1065	4.4	302	1.2	24193	1155800	2.1
1969	14484	51.2	11971	42.3	1356	4.8	496	1.8	28307	1255500	2.3
1971	16050	50.6	13553	42.7	1555	4.9	568	1.8	31726	1302600	2.4
1973									33268	1392300	2.4
1975	10321	29.0	22433	63.0	2395	6.7	425	1.3	35923	1448000	2.5

SOURCE: State of Florida, Department of Natural Resources.

TABLE 3

1975 DADE COUNTY BOAT REGISTRATIONS BY YEAR BUILT AND LENGTH

Year Built	Length							Row Total
	1' to 15'	16' to 20'	21' to 25'	26' to 39'	40' to 64'	65' and over		
Before 1950	31.1	16	24	72	26	3	172	
	18.03	9.3	14.0	41.9	15.1	1.7	.5	
	.3	.1	.4	3.0	6.3	18.8		
1950 - 1954	120	55	23	39	13	0	250	
	48.0	22.0	9.2	15.6	5.2	.0	.7	
	1.2	.3	.3	1.6	3.2	.0		
1955 - 1959	1132	597	142	104	23	2	2000	
	56.6	29.8	7.1	5.2	1.1	.1	5.6	
	11.0	3.8	2.1	4.3	5.6	12.5		
1960 - 1964	1281	1986	486	261	40	4	4058	
	31.6	48.9	12.0	6.4	1.0	.1	11.4	
	12.4	12.6	7.3	10.9	9.8	25.0		
1965 - 1969	2966	5431	1793	707	118	3	11018	
	26.9	49.3	16.3	6.4	1.1	.0	31.0	
	28.7	34.4	27.0	29.5	28.8	18.8		
1970	833	1394	579	200	36	2	3044	
	27.4	45.8	19.0	6.6	1.2	.1	8.6	
	8.1	8.8	8.7	8.4	8.8	12.5		

TABLE 3 CONTINUED

Year Built	Length							Row Total
	1' to 15'	16' to 20'	21' to 25'	26' to 39'	40' to 64'	65' and over		
1971	25.4 6.8	46.3 8.1	20.3 8.4	6.9 7.9	1.1 7.1	.0 .0	7.7	
1972	917 26.8 8.9	1433 41.9 9.1	815 23.8 12.3	222 6.5 9.3	35 1.0 8.5	2 .1 12.5	3424 9.6	
1973	1056 26.0 10.2	1717 42.2 10.9	981 24.1 14.8	266 6.5 11.1	45 1.1 11.0	0 .0 .0	4065 11.4	
1974	1011 30.0 9.8	1333 39.6 8.4	769 22.8 11.6	220 6.5 9.2	35 1.0 8.5	0 .0 .0	3368 9.5	
1975	273 19.2 2.6	564 39.7 3.6	458 32.3 6.9	115 8.1 4.8	9 .6 2.2	0 .0 .0	1419 4.0	
Column Total	10321 29.0	15803 44.4	6630 18.6	2395 6.7	409 1.2	16 .0	35574 ⁴ 100.0	

SOURCE: State of Florida, Department of Natural Resources, List of Registered Boat Owners (1975).

1 Count

2 Row Percentage

3 Column Percentage

4 349 boat registrations lack either boat size or year built.

TABLE 4

1975 DADE COUNTY BOAT REGISTRATIONS BY YEAR BUILT AND TYPE

Year Built	Outboard	Inboard	Sail	Other	Row Total
Before 1950	39 ¹	106	14	7	166
	23.5 ²	63.9	8.4	4.2	.5
	.2 ³	1.1	2.3	.9	
1950 - 1954	155	79	11	4	249
	62.2	31.7	4.4	1.6	.7
	.6	.8	1.8	.5	
1955 - 1959	1675	290	13	18	1996
	83.9	14.5	.7	.9	5.6
	6.9	3.0	2.1	2.3	
1960 - 1964	3031	905	47	59	4042
	75.0	22.4	1.2	1.5	11.4
	12.5	9.4	7.8	7.5	
1965 - 1969	7534	3075	171	203	10983
	68.6	28.0	1.6	1.8	31.0
	31.0	31.8	28.2	25.8	
1970	2069	840	45	75	3029
	68.3	27.7	1.5	2.5	8.6
	8.5	8.7	7.4	9.5	
1971	1873	754	52	65	2744
	68.3	27.5	1.9	2.4	7.8
	7.7	7.8	8.6	8.3	
1972	2285	983	54	70	3393
	67.3	29.0	1.6	2.1	9.6
	9.4	10.2	8.9	8.9	
1973	2710	1131	73	130	4044
	67.0	28.0	1.8	3.2	11.4
	11.1	11.7	12.0	16.5	
1974	2160	977	79	124	3340
	64.7	29.3	2.4	3.7	9.4
	8.9	10.1	13.0	15.8	
1975	794	537	47	32	1410
	56.3	38.1	3.3	2.3	4.0
	3.3	5.5	7.8	4.1	
Column Total	24325 68.7	9677 27.3	606 * 1.7	787 2.2	35396 100.0

SOURCE: State of Florida, Department of Natural Resources, List of Registered Boat Owners (1975).

* This figure appears to be small when compared to the wet-berth survey (Table 6).

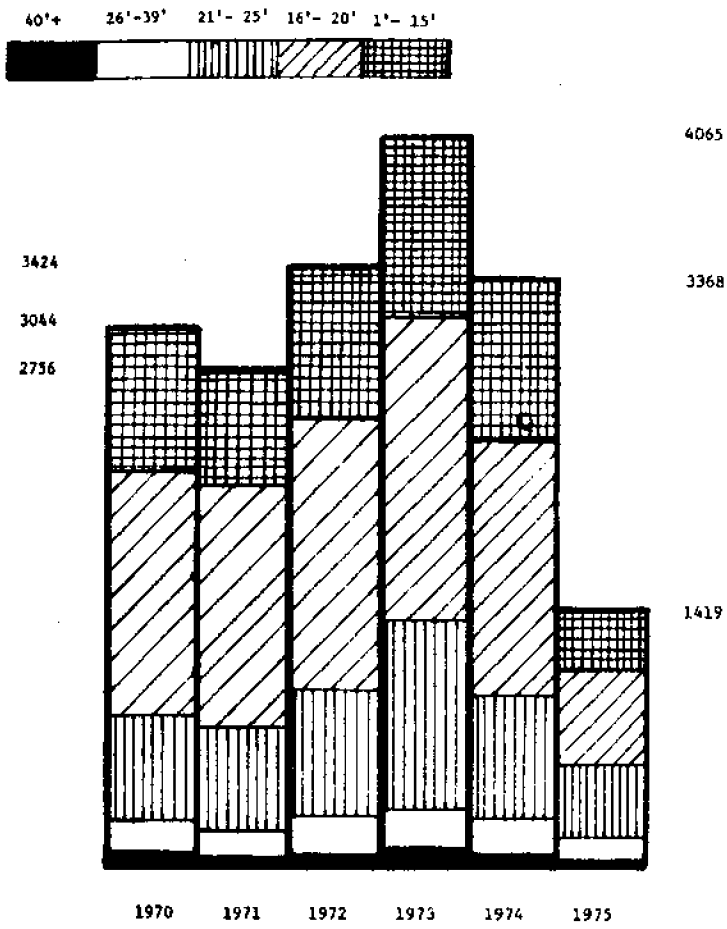


Figure 4, 1975 Dade County boat registrations by year built and length.

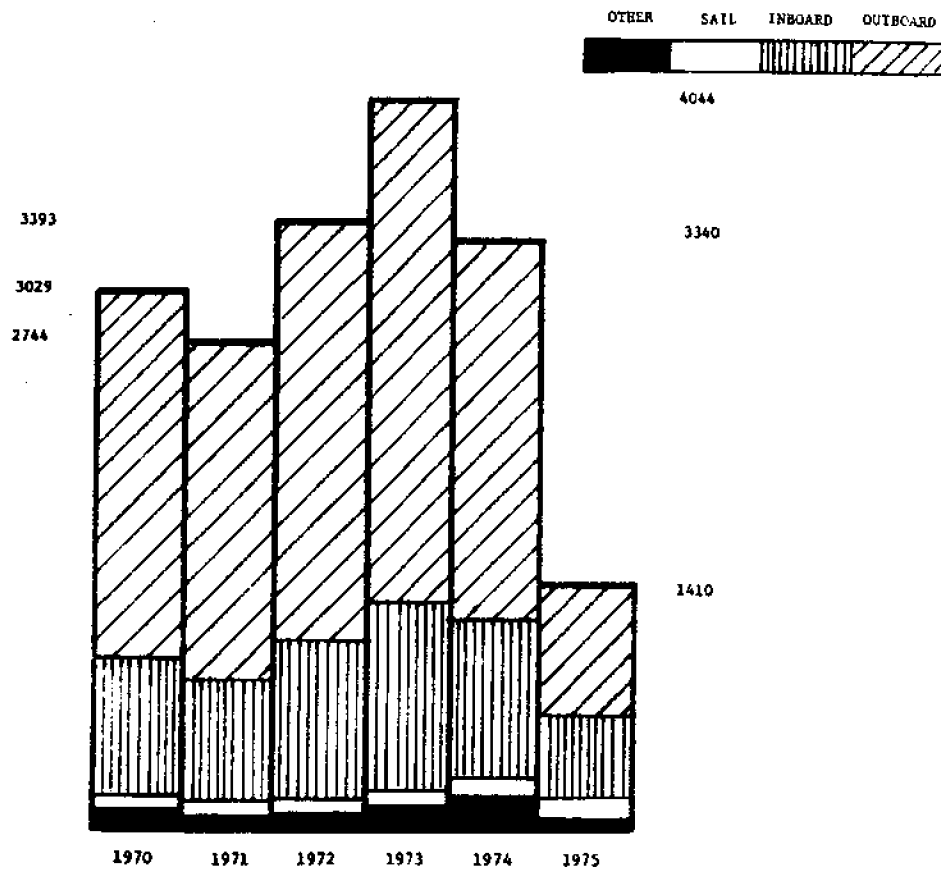
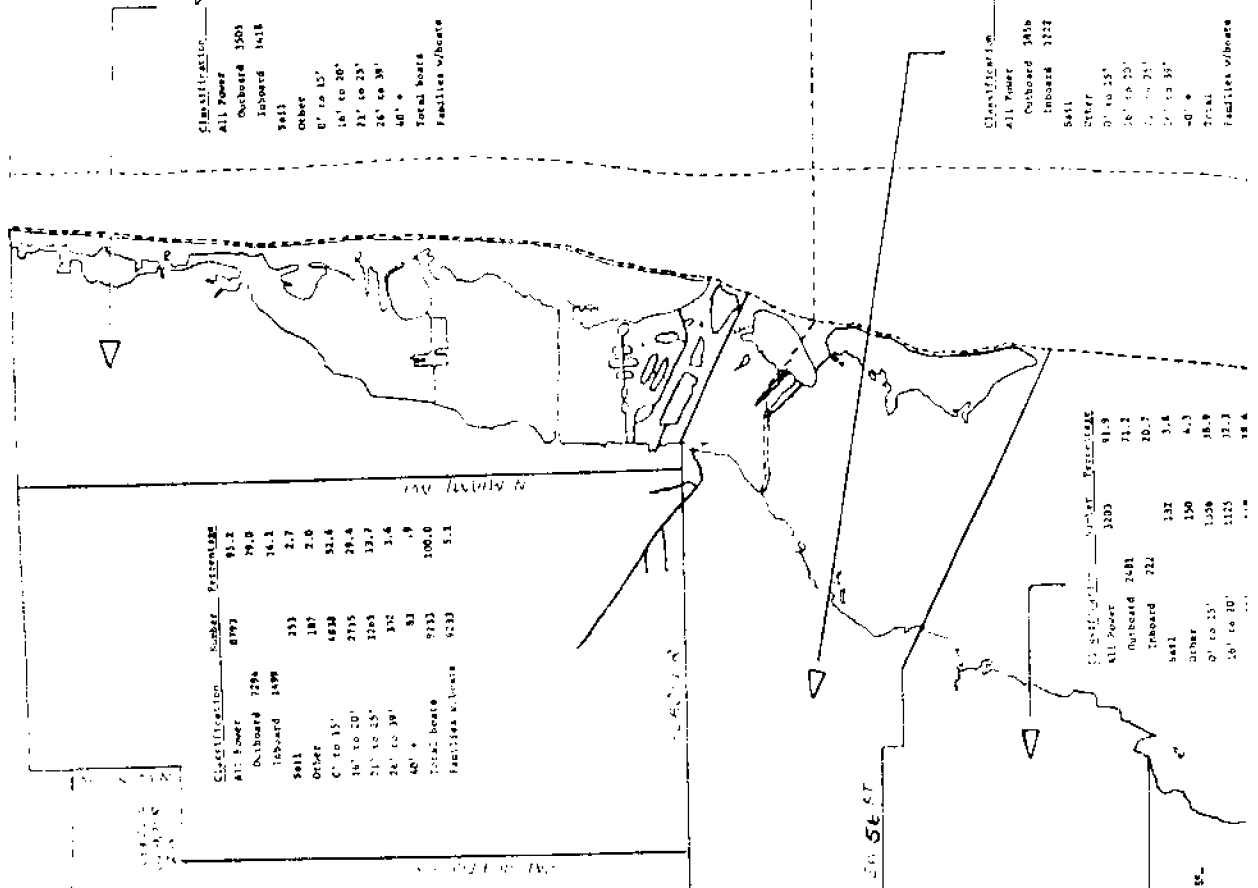


Figure 5. 1975 Dade County boat registrations by year built and type.



Classification	Number	Percentage
All Power	4933	97.2
Onboard 1501		69.2
Onboard 1418	134	28.0
Shell	10	0.2
Other	1864	36.8
0' to 15'	1227	24.1
16' to 20'	811	17.2
21' to 25'	503	9.9
26' to 30'	101	2.0
40' +	505	10.0
Total boats	5085	100.0
Facilities without	5085	4.6

Classification	Number	Percentage
All Power	5074	91.8
Onboard 1418		69.7
Onboard 1522	399	7.8
Shell	155	3.1
Other	2301	43.6
0' to 15'	1472	28.4
16' to 20'	1768	34.8
21' to 25'	517	10.0
26' to 30'	110	2.1
40' +	535	10.0
Total	5537	6.7
Facilities without	5537	6.7

Classification	Number	Percentage
All Power	1274	93.1
Onboard 1418		99.8
Onboard 1499	233	18.3
Shell	187	14.3
Other	688	51.4
0' to 15'	2735	20.4
16' to 20'	1265	9.4
21' to 25'	332	2.5
26' to 30'	83	0.6
40' +	933	7.0
Total boats	6233	100.0
Facilities without	6233	4.3

Classification	Number	Percentage
All Power	1300	91.9
Onboard 1418		71.1
Onboard 1491	222	16.3
Shell	132	9.4
Other	150	10.8
0' to 15'	1328	98.3
16' to 20'	1125	83.3
21' to 25'	114	8.5
26' to 30'	114	8.5
40' +	114	8.5

Classification	Number	Percentage
All Power	283	92.5
Onboard 122		75
Onboard 50	17.5	5.6
Shell	7	2.3
Other	18	5.8
0' to 15'	161	51.1
16' to 20'	70	21.8
21' to 25'	15	4.6
26' to 30'	7	2.2
40' +	14	4.3
Total boats	293	100.0
Facilities without	287	9.8

Classification	Number	Percentage
All Power	310	94.7
Onboard 122		76.0
Onboard 154	39	12.6
Shell	24	7.7
Other	6	1.9
0' to 15'	300	96.8
16' to 20'	10	3.2
21' to 25'	0	0.0
26' to 30'	0	0.0
40' +	0	0.0
Total	310	100.0
Facilities with boats	310	2.0

Classification	Number	Percentage
All Power	1381	96.1
Onboard 1227		74.5
Onboard 154	39	2.8
Shell	32	2.3
Other	24	1.7
0' to 15'	1217	88.1
16' to 20'	120	8.7
21' to 25'	24	1.7
26' to 30'	6	0.4
40' +	0	0.0
Total	1437	100.0
Facilities with boats	1437	6.9

Classification	Number	Percentage
All Power	3126	93.5
Onboard 1221		79.3
Onboard 1521	912	29.1
Shell	179	5.6
Other	139	4.3
0' to 15'	1125	35.7
16' to 20'	912	29.1
21' to 25'	139	4.3
26' to 30'	139	4.3
40' +	139	4.3

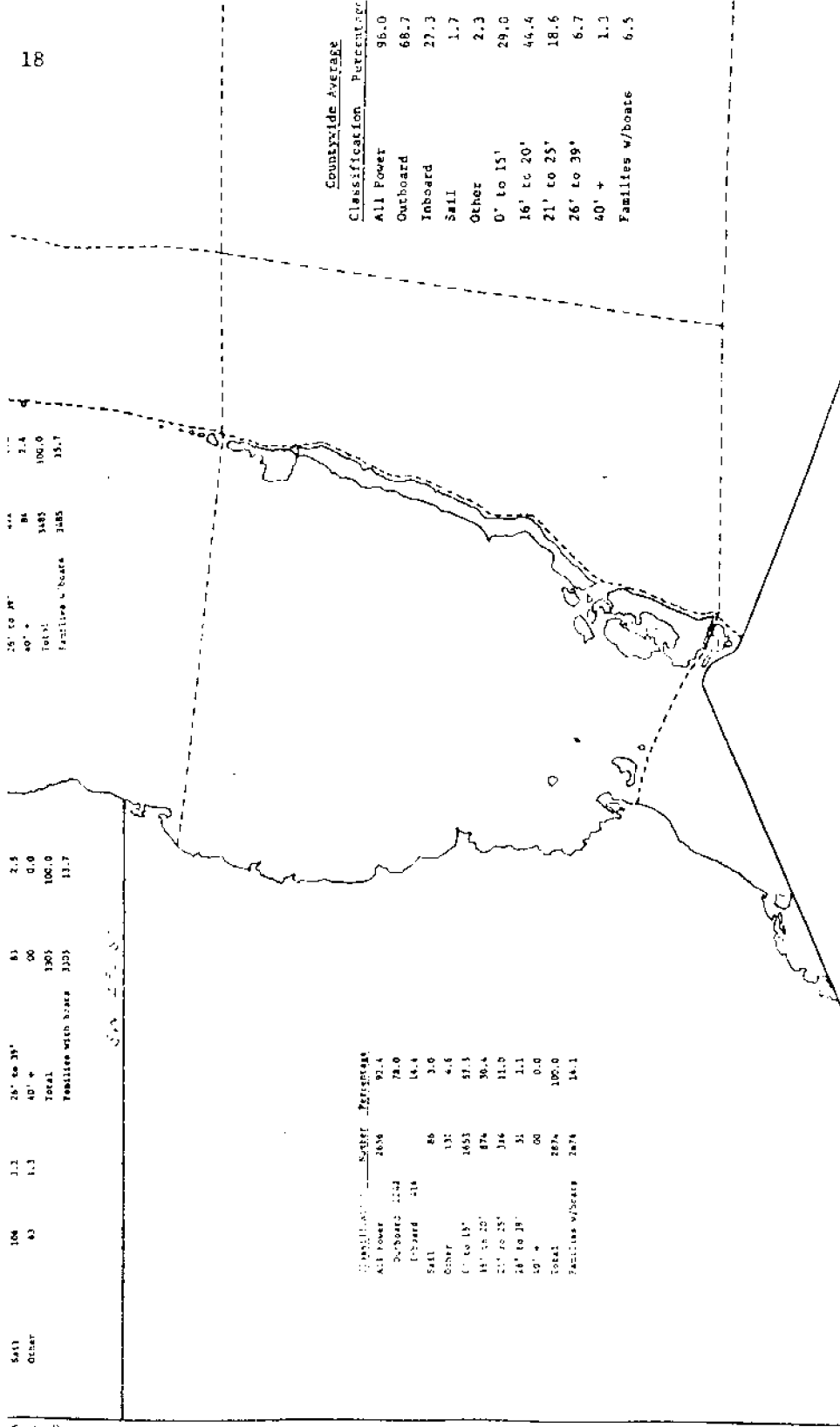


Figure 6. 1975 Dade County boat registrations by length by type by residence area.

TYPE	10-25	26-50	51-100	101-200	201-600
PRIVATE POWER BOATS	■	■	■	■	■
PRIVATE SAILBOATS	□	□	□	□	□
COMMERCIAL BOATS	○	○	○	○	○
FLOATING HOMES	●	●	●	●	●

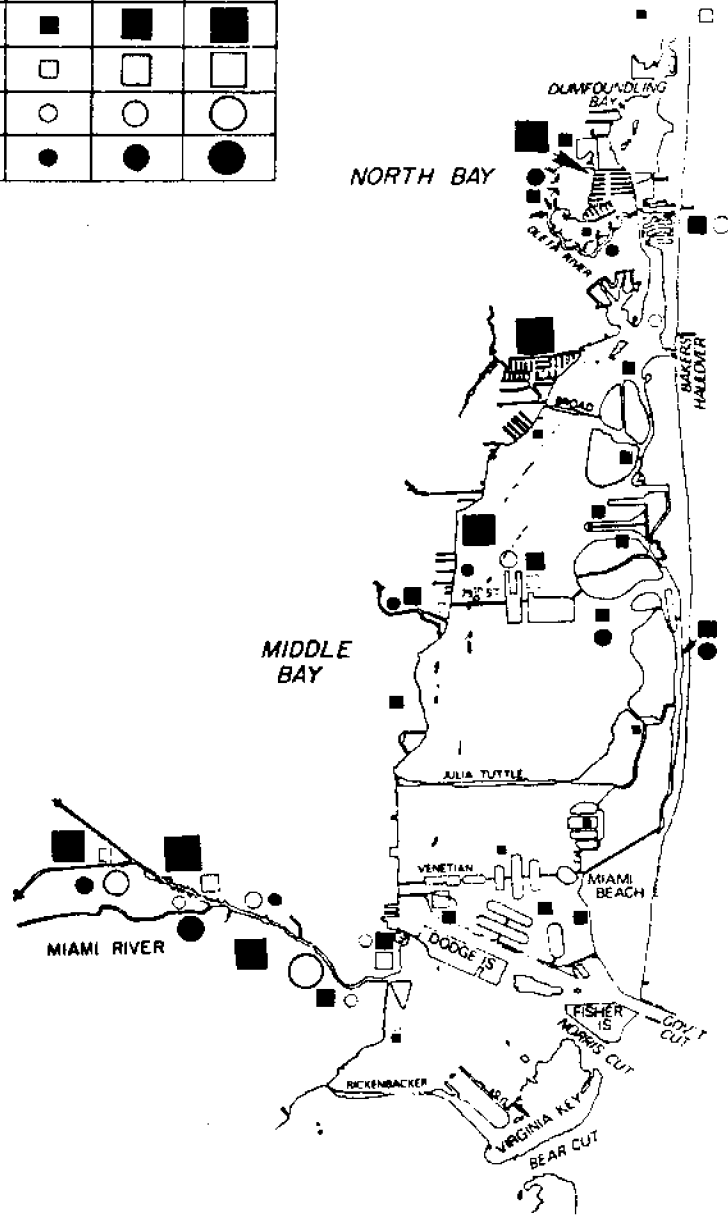


Figure 7. Distribution of berthed boats in Dade County north of Rickenbacker Causeway.

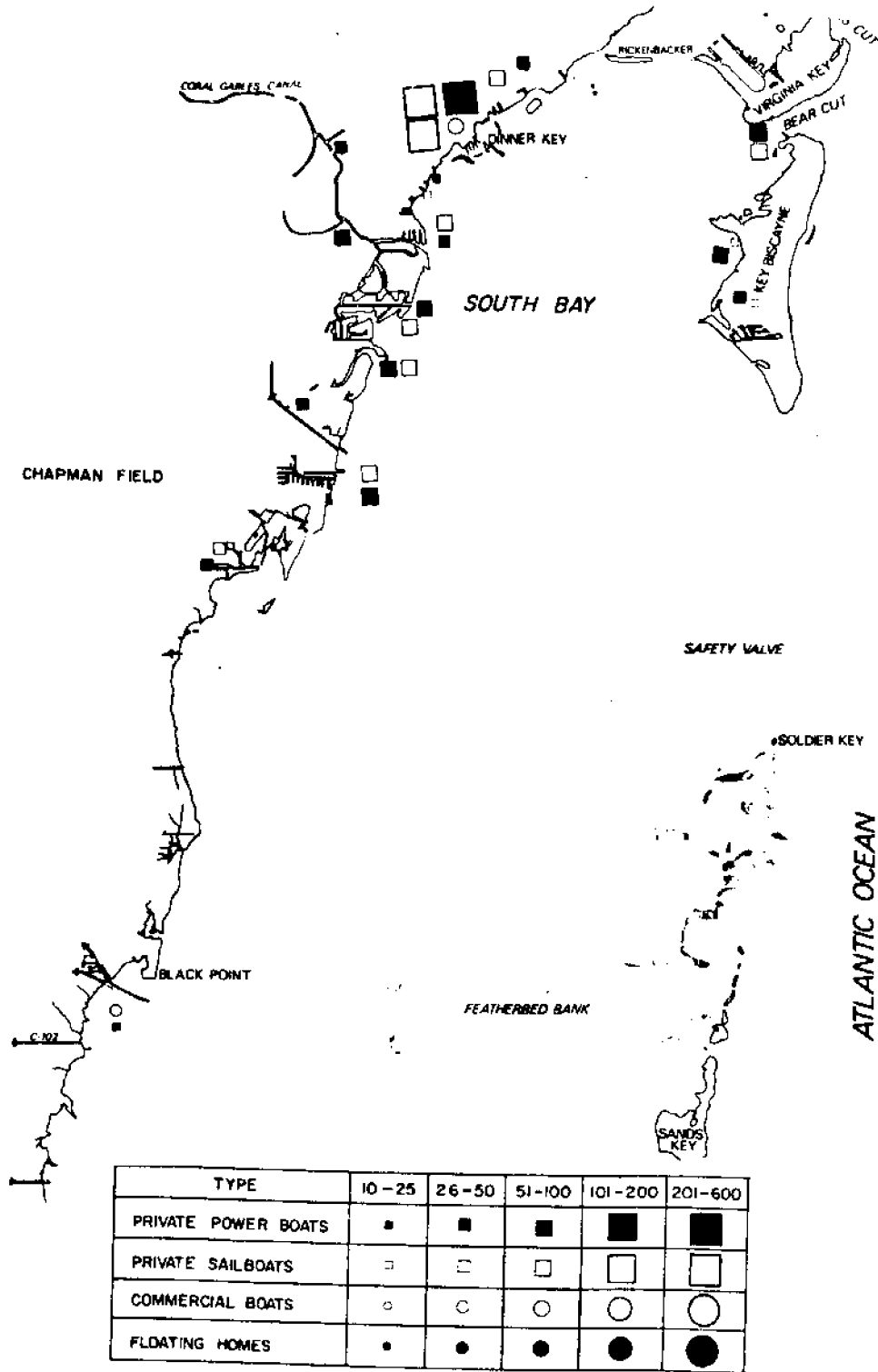


Figure 8. Distribution of berthed boats in Dade County between Rickenbacker Causeway and Featherbed Bank.

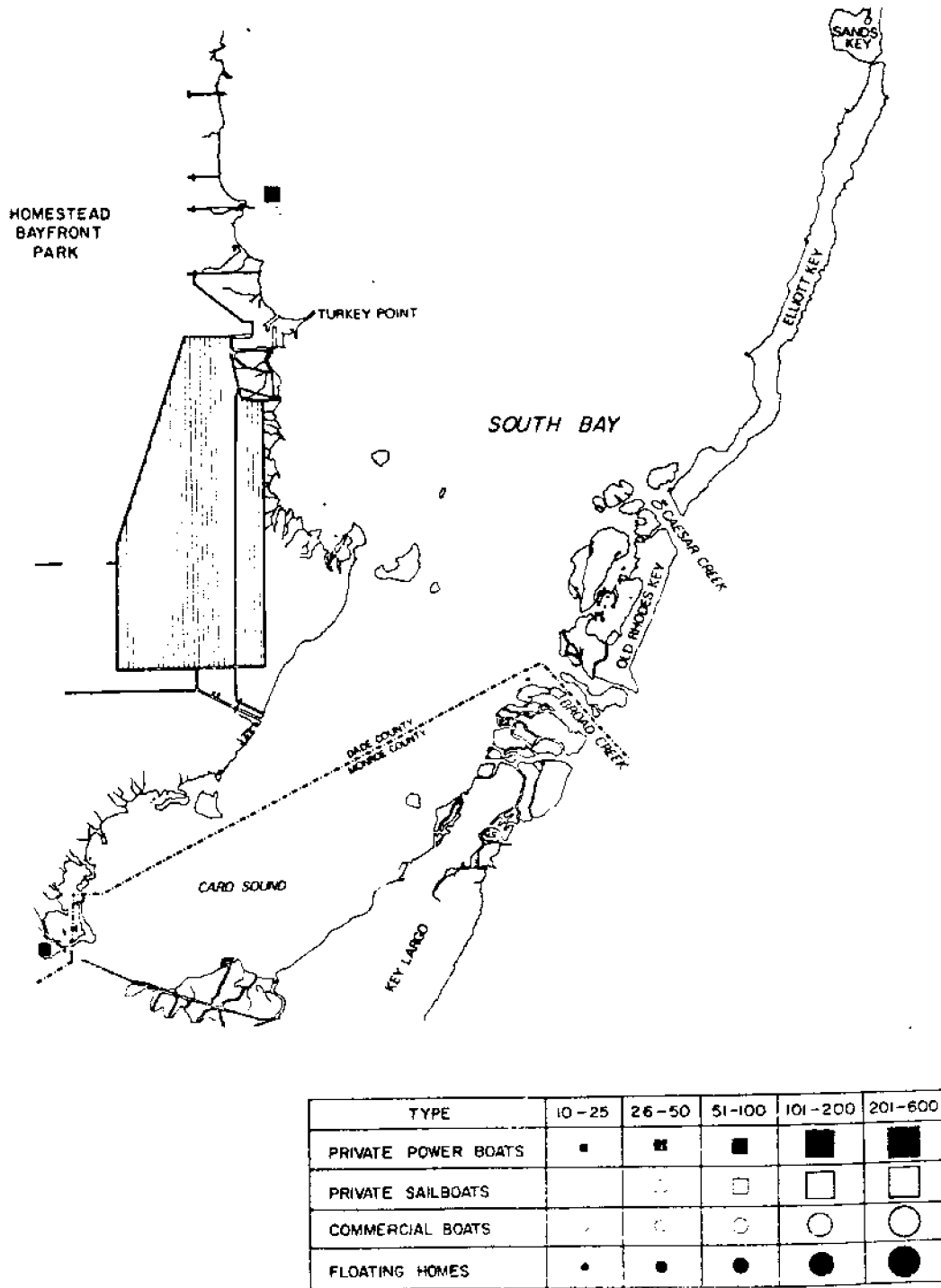


Figure 9. Distribution of berthed boats in Dade County south of Featherbed Bank to Monroe County.

TABLE 5
1975 DADE COUNTY BOAT REGISTRATIONS BY RESIDENCE AREA

Area	Population	# Households	# Registered Boats	% Households Owning Boats
1	21,785	6642	287	4.3
2	537,066	169,272	9,232	5.5
3	328,290	156,761	5,065	3.2
4	61,520	20,952	1,437	6.9
5	243,318	83,068	5,532	6.7
6	51,963	16,379	359	2.2
7	65,568	17,648	3,485	19.7
8	71,010	17,359	3,305	19.0
9	60,920	17,863	2,874	16.1
TOTAL	1,441,940	505,944	31,577*	6.2

SOURCE: State of Florida, Department of Natural Resources, List of Registered Boat Owners (1975).

* 4,346 boats are registered to families giving addresses outside Dade County.

Categories are established according to size class, type of boat, registration, and type of berth. Size classes follow U.S. Coast Guard categories with the first two size classes combined. They are: zero to less than 26 feet, 26 feet to less than 40 feet, 40 feet to less than 65 feet, and 65 feet and longer. These are referred to as size classes I through IV, respectively. Four major hull categories are established: private sail, private power, floating homes, and commercial craft. Private power boats are subdivided by type of power: outboard, outdrive, or inboard. Commercial craft were subdivided by activity: fishing, charter, or transport. Charter includes head boats, sailboat rentals, and excursion boats, as well as what are normally considered charter fishing boats.

Transport is defined as all commercial vessels not fishing or directly for hire to the public. This includes freighters, barges, tug boats, etc. The type of registry of private boats is recorded as documented yacht, Florida registered, or registered in some other state. Dockage is divided into private and organized categories. Private dockage is primarily those berths at private homes, but includes condominiums, commercial transport, and fishing establishments. Organized dockage includes private clubs, commercial marinas, and public marinas. Freighters and cruise ships in the port of Miami, craft owned by government agencies, university research boats, and dinghy-type tenders are not included (see Tables 6-11).

Existing Waterfront Facilities

Figure 10 and Table 12 indicate the locations and services offered by waterfront boating facilities in Dade County. Data is omitted where it is not available or marina operators requested the information remain confidential.

Existing Sites

Dade County operates five waterfront sites for recreational boating and is planning two additional marinas (Figure 11). Each existing site is briefly described, beginning with the most northerly facility.

Haulover Boat Ramp

Haulover has paved parking for 95 car-trailer units with off-pavement (grass) parking for an additional 50 units (maximum of approximately 145 car-trailer units). The 300-foot wide ramp can accommodate approximately 23 boats simultaneously. There is no charge and the facility is open at all times. One mile south of the ramp are commercial charter boat docks, fuel dock (gas, diesel), and a dockside restaurant (the restaurant and gas

TABLE 6

BERTHED HULLS IN DADE COUNTY BY LENGTH, TYPE, REGISTRATION, TYPE BERTH

Hull Type	Registry		Private Length Class				Organized Length Class				Total Length Class						
	I	II	I	III	IV	Total	I	II	III	IV	Total	I	II	III	IV	Total	
Sail	Florida	199	220	17			436	425	406	41			872	544	626	58	1308
	Documented		53	40			93	1	141	111	1		254	1	194	151	347
	Out-of-State	1	4	1			6	3	31	5			39	4	35	6	45
Total	200	277	58			535	429	578	157	1		1165	629	855	215	1	1700
Power -	All	207	4				211	62	10	2			74	269	14	2	285
	Outdrive	327	91	2			420	135	107	3			245	462	198	5	665
	Florida	128	660	63	1		852	133	614	63			810	261	1274	126	1662
	Documented		86	127	11		224	112	189	39			340	198	316	50	564
	Out-of-state	1	17	12			30	13	15	15			28	1	30	27	58
Total	663	858	204	12		1737	330	856	272	39		1497	993	1714	476	51	3234
Total Power and Sail	863	1135	262	12		2272	759	1434	429	40		2662	1622	2569	691	52	4934
Commercial -	Fishing	41	73	37	3		154	27	37	19	3		86	68	110	56	240
	Charter		7	4	1		12	25	28	54	11		118	25	35	58	130
	Transport	5	20	29	44		98	2	3	6	3		14	7	23	35	47
	Total	46	100	70	48		264	54	68	79	17		218	100	168	149	65
Total Boats	909	1235	332	60		2536	813	1502	508	57		2880	1722	2737	840	117	5416
Floating Homes	17	120	43	2		182	7	80	29			116	24	200	72	2	298
Total Hulls	926	1355	375	62		2718	820	1582	537	57		2996	1746	2937	912	119	5714

Length Classes: I 0 to less than 26' III 40 to less than 65'
 II 26 to less than 40' IV 65' and longer

TABLE 7

BERTHED HULLS IN NORTH BAY BY LENGTH, TYPE, REGISTRATION, TYPE BERTH.

Hull Type	Registry				Private Length Class				Organized Length Class				Total Length Class			
	I	II	III	IV	Total	I	II	III	IV	Total	I	II	III	IV	Total	
Sail	Florida	5	9	1	15	1	3			4	6	12	1		19	
	Documented		2		2	1	1			2	3	3	1		4	
	Out-of-State	5	11	1	17	1	5	1	1	7	6	16	2		24	
Power --	All	38	1		39	4				4	42	1			43	
	Outdrive	73	9		82	5	9			14	78	18			96	
	Florida	11	115	3	129	2	74	4	80	13	189	7		209		
	Documented	1	11	10	21	1	6	1	8	3	12	16	1		29	
	Out-of-state	123	138	18	179	11	86	11	1	109	134	224	29	1	388	
Total Power and Sail	128	149	19	296	12	91	12	1	116	140	240	31	1	412		
Commercial - Fishing Charter Transport Total		1	3		4	1	2			3	2	5			7	
			2		2	12	32	11	55		14	32	11		57	
			3	1	7	1	14	32	11	58	2	22	33	14	71	
Total Boats	129	157	20	309	13	105	44	12	174	142	262	64	15	483		
Floating Homes					3	44	6		53	3	44	6		53		
Total Hulls	29	157	20	309	16	149	50	12	227	145	306	70	15	536		

Length Classes: I 0 to less than 26' III 40 to less than 65'
 II 26 to less than 40' IV 65' and longer

TABLE 8

BERTHED HULLS IN MIAMI BEACH BY LENGTH, TYPE, REGISTRATION, TYPE BERTH.

Hull Type	Registry	Private Length Class				Organized Length Class				Total Length Class				
		I	II	III	IV	Total	I	II	III	IV	Total	I	II	III
Sail	Florida	26	25	2	53	1	1	1	3	3	27	26	3	56
	Documented		13	8	21			1	1		13	9	2	
	Out-of-State													
	Total	26	38	10	74	1	1	2	4	4	27	39	12	78
Power --	All	43	1		44	1			1	44	1		45	
	Outboard	78	12		90	4	1		5	82	13		95	
	Outdrive	17	125	12	154	10	1		11	17	135	13	165	
	Inboard		15	40	63	6	20	1	27	21	60	9	90	
	Documented		4	5	9					4	5		9	
	Out-of-state	138	157	57	360	5	17	21	44	143	174	78	404	
Total		164	195	67	434	6	18	23	48	170	213	90	482	
Total Power and Sail														
Commercial - Fishing Charter Transport Total			2		2	3	1		4		5	1	6	
					2	3	1		4		5	1	6	
Total Boats		164	197	67	436	6	21	24	52	170	218	91	488	
Floating Homes		2	43	28	75	1	22	18	41	3	65	46	116	
Total Hulls		166	240	95	511	7	43	42	93	173	283	137	604	

Length Classes: I 0 to less than 26' III 40 to less than 65'
 II 26 to less than 40' IV 65' and longer

TABLE 9

BERTHED HULLS IN MIDDLE BAY BY LENGTH, TYPE, REGISTRATION, TYPE BERTH.

Hull Type	Registry		Private Length Class				Organized Length Class				Total Length Class						
	I	II	I	II	III	IV	Total	I	II	III	IV	Total	I	II	III	IV	Total
Sail	26	19	4	4	49	8	47	42	47	8	97	68	66	12	146		
	Florida		6	2	8	21	20	21	41	26	23	49					
	Documented		26	25	6	57	44	73	33	150	70	98	39	207			
Power -	61	80	16	1	61	8	27	15	42	8	69	69	31	1	69		
	Outboard		17	136	15	168	13	100	14	127	30	236	29	295			
	Outdrive		17	23	2	40	7	42	24	73	34	65	24	113			
	Inboard		6	2	8	3	3	2	5	5	9	4	13				
	Documented		158	175	41	374	48	125	58	255	206	300	99	24	629		
Out-of-state		184	200	47	431	92	198	91	24	405	276	398	138	24	836		
Total Power and Sail		185	207	52	5	449	93	203	108	24	428	278	410	160	29	877	
Commercial -	1	9	6	16	6	2	8	1	15	8	24	1	15	8	24		
	Fishing		186	216	58	5	465	93	203	110	24	436	279	425	168	29	901
Charter		Length Classes: I 0 to less than 26' III 40 to less than 65'															
Transport		II 26 to less than 40' IV 65' and longer															
Total																	
Total Boats																	
Floating Homes																	
Total Hulls																	

TABLE 10

BERTHED HULLS IN MIAMI RIVER BY LENGTH, TYPE, REGISTRATION, TYPE BERTH.

Hull Type	Registry		Private Length Class				Organized Length Class				Total Length Class						
	I	II	I	II	III	IV	Total	I	II	III	IV	Total	I	II	III	IV	Total
Sail	Florida	18	37	4	59	16	37	3	56	34	74	7	115				
	Documented		11	16	27	6	12	18		17	28	45					
	Out-of-State		1		1	3	3			4		4					
	Total	18	49	20	87	16	46	15	77	34	95	35	164				
Power -	All	14	1	15	7					21	1		22				
	Outboard	36	24	60	42	13	2	57		78	37	2	117				
	Outdrive	54	100	10	165	72	200	25	297	126	300	35	462				
	Inboard		25	29	55	30	54	12	96		55	83	13	151			
	Documented		1	1	2								5				
	Out-of-state	104	151	39	296	121	245	83	461	225	396	122	757				
	Total	122	200	59	383	137	291	98	538	259	491	157	921				
Commercial -	Fishing	39	67	37	146	7	13	19	42	46	80	56	188				
	Charter		3	2	6	2					5	2	8				
	Transport	4	10	24	74	1	4	3	8	5	10	28	39				
	Total	43	80	63	226	8	15	23	52	51	95	86	278				
Total Boats		165	280	122	609	145	306	121	590	310	586	233	1199				
Floating Homes		12	68	8	8	1	6	3	10	13	74	11	98				
Total Hulls		177	348	130	697	146	312	124	600	323	660	254	1297				

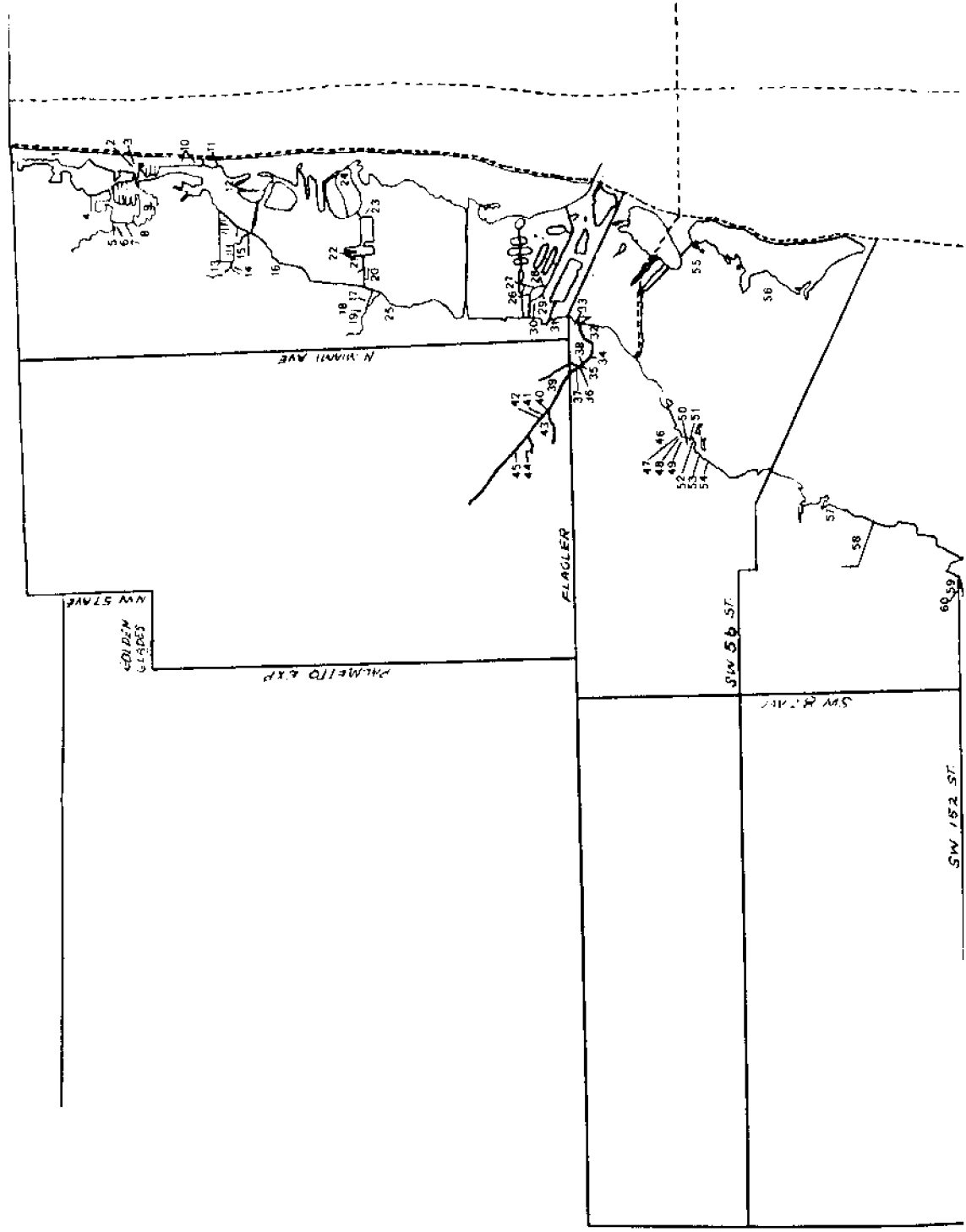
Length Classes: I 0 to less than 26' III 40 to less than 65'
 II 26 to less than 40' IV 65' and longer

TABLE 11

BERTHED HULLS IN SOUTH BAY BY LENGTH, TYPE, REGISTRATION, TYPE BERTH.

Hull Type	Registry		Private Length Class				Organized Length Class				Total Length Class				
	I	II	I	III	IV	Total	I	II	III	IV	Total	I	II	III	IV
Sail	Florida	124	130	6	260	365	318	29	712	489	448	35	972		
	Documented	21	14	35	1	114	76	1	192	1	135	90	1	227	
	Out-of-State	1	3	1	5	1	21	1	23	2	24	2	28		
	Total	125	154	21	300	367	453	106	927	492	607	127	1	1227	
Power - Outboard Outdrive Inboard	All	51	1	52	42	10	2	54	93	11	2	106			
	All	60	30	1	91	57	69	1	127	117	99	2	218		
	Florida	29	184	23	236	46	230	19	295	75	414	42	531		
	Documented	18	25	2	45	68	67	1	136	86	92	3	181		
Out-of-state	4	4	4	6	6	10	16	20	10	10	10	20			
Total	140	237	49	2	428	145	383	99	628	276	603	148	3	1056	
Total Power and Sail	265	391	70	2	728	512	836	205	2	1555	777	1227	275	4	2283
Commercial - Fishing Charter Transport Total	Fishing	1	3	4	19	22	41	20	25	45					
	Charter	1	1	1	25	6	5	36	25	6	6				
	Transport	1	3	1	3	1	4	3	3	1	4				
	Total	1	3	1	5	44	31	6	81	45	34	7	86		
Total Boats	266	394	71	2	733	556	867	211	2	1636	822	1261	282	4	2369
Floating Homes	2	1	3	2	2	4	2	1	7						
Total Hulls	268	394	72	2	736	558	869	211	2	1640	826	1263	283	4	2376

Length Classes: I 0 to less than 26' III 40 to less than 65'
 II 26 to less than 40' IV 65' and longer



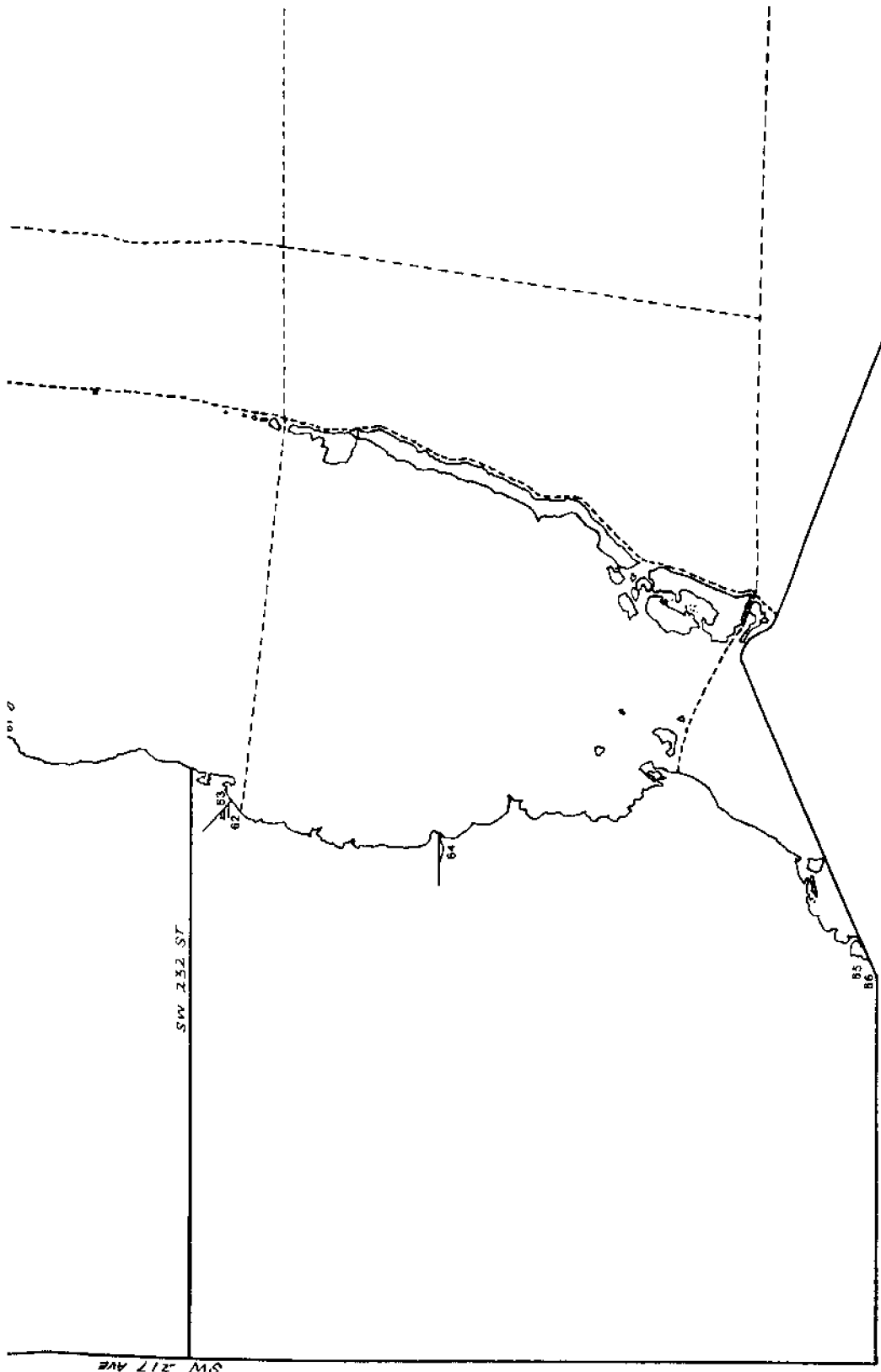


Figure 10. Location of waterfront boating facilities in Dade County.

TABLE 12

FACILITIES PROVIDED BY WATERFRONT BOATING ESTABLISHMENTS IN DADE COUNTY

NUMBER	NAME	NUMBER OF BERTHS		RAVE		HOISTS		TYPE OF FACILITY	CHARGES			FUEL	
		wet	dry	width (ft.)	floaton trailers	number	capa- city		berths	ramp	hoist	gasoline reg. system.	refuel
1	Sheraton Beach Hotel 19400 Collins Ave.	17						Hotel Docks	(wet) \$0.10/ft/day (wet, live-aboard) \$.20/ft/day			X	X
2	Gray Line Boats 450 Sunny Isles Blvd.	20						Commercial Marina	\$2.25/ft/month			X	X
3	Jerry's Marine Center 400 Sunny Isles Blvd.	25				2	25 tons	Commercial Marina	\$2.25/ft/month		\$1.00/ft	X	X
4	Hi Lift Marine 2890 NE 187 St.		300			2	28 ft.	Commercial Marina	(rack) \$46.80-\$78.00/month			X	X
5	Offshore Marine 17501 Biscayne Blvd. North Miami		107			1 1	24 ft. 40 ft.	Commercial Marina	(rack storage) \$2.25/ft/month (trailer) \$15/month		\$1.50/ft	X	
6	Snug Harbor Marine 17355 Biscayne Blvd.	22					2 tons	Commercial Marina	(wet, houseboats) (dry) \$0.12/ft/day \$2.00/ft/month		\$14.00		
7	Maule Lake Marina 17107 Biscayne Blvd.	150	200			2	6 tons	Commercial Marina	(wet) \$0.20/ft/day (dry,rack) \$41.00-\$61.00/month			X	X
8	Blue Marlin Marina 2500 NE 173 St.	12		50	yes			Commercial Marina					
9	Aqua Marina 3000 Sunny Isles Blvd.	60				1	50 ft.	Commercial Marina	\$2.00/ft/month		\$2.00/ft		
10	Haulover Park 10800 Collins Ave.	14		295	yes			Public Marina (county)	Charter boats only	Free		X	X

TABLE 12 (CONT'D)

NUMBER	NAME	NUMBER OF BERTHS		RAMP		HOISTS		TYPE OF FACILITY	CHARGES			FUEL	
		wet	dry	width (ft.)	floaton trailers	number	capa-city		berths	ramp	hoist	gasoline reg. prem.	diesel
11	Bal Harbour Club 10201 Collins Ave. Bal Harbour	40						Private Club					
12	Bay Harbor Hotel 9660 E. Bay Harbor Dr. Bay Harbor Islands	3						Hotel Docks	(wet) \$0.50/ft/day				
13	Keystone Point, Inc. 1950 NE 135 St. North Miami	65	300			2	31 ft.	Commercial Marina	(wet) \$0.15/ft/day (dry, inside) \$2.50/ft/month (dry, outside) \$2.00/ft/month			X	X
14	Biscayne Marine 13301 Biscayne Blvd. North Miami		97			1	3 tons	Commercial Marina	(dry, rack) \$2.25/ft/month	\$10.00	X	X	X
15	Keystone Harbour Club 131 Ixora Ct. North Miami	14						Condominium Docks					
16	Jockey Club, Inc. 1111 Biscayne Blvd. North Miami	53				1	23 ft.	Private Club			free to members	X	X
17	Skyway Marine 820 NE 79th St.	20	50			1	9 tons	Commercial Marina	(wet) \$2.50-\$2.75/ft/month (rack) \$50-\$70/month		\$2.00/ft	X	
18	Little River Marina 724 NE 79th St.	20	230			2	6 tons	Commercial Marina	(wet) \$3.30/ft/month (dry, rack) \$56/month		\$1.00/ft	X	X
19	Marine Plaza Apartments 660 NE 78th St.	25						Apartment Docks	\$24.88-\$56.00/month				
20	Pelican Harbor 1275 79th St. N. Bay Village	19		147	yes	1	out of order	Public Marina (county)	\$0.05/ft/day storage \$0.10/ft/day live aboard	free			

TABLE 12 (CONT'D)

NUMBER	NAME	NUMBER OF BERTHS		RAMP		HOISTS		TYPE OF FACILITY	CHARGES			FUEL	
		wet	dry	width (ft.)	floaton trailers	number	capa-city		berths	wrap	hoist	gasoline reg. prec.	diesel
21	Harbor West Yacht Club 7910 West Drive N. Bay Village	27						Commercial Marina	Houseboats - 1 story \$150- \$185, 2 stories \$200 Cruisers \$135/month				
22	Racquet Club 7930 East Drive Harbor Island, N. Bay Village	22				1	23 ft.	Private Club	(wet) \$0.15-\$0.20/ft/day	free			
23	Flamingo Yacht Basin 1900 79th St. Causeway North Bay Village	62						Commercial Marina	(wet) \$0.17/ft/day (wet, transient) \$0.25/ft/day				
24	King Cole Hotel and Yacht Club 900 Bay Drive Miami Beach	32							\$2.25/ft/month (summer) \$4.50/ft/month (winter)				
25	Palm Bay Yacht Club 1 Palm Bay Cr.	35						Private Club			X	X	X
26	Miami Yacht Club 1001 MacArthur Cswy.	42	120	12	yes	1		Private Club					
27	Watson Island Park MacArthur Cswy.			213	yes			Public Boat Ramp (city)		free			
28	Miami Outboard Club 1099 MacArthur Cswy.	50	35			2	4 tons	Private Club					
29	Bette and Bert Beyfront 66 Marine, Inc. 1050 MacArthur Cswy.	0						Fuel and Supplies			X	X	X
30	Watson Island Marina MacArthur Causeway	43						Public Marina (city)	\$36.00-\$42.00/month depen- dent on slip length				

TABLE 12 (CONT'D)

NUMBER	NAME	NUMBER OF BERTHS		RAMP		HOISTS		TYPE OF FACILITY	CHARGES			FUEL	
		wet	dry	width (ft.)	floaton trailers	number	capacity		berths	ramp	hoist	gasoline	diesel
31	Miamarina Miami Bayfront Park	208						Public Marina (city)	\$0.15/ft/day				
32	Sheraton 4 Ambassadors Marina 801 S. Bayshore Dr.	18						Hotel Docks	(wet) \$65-\$150/month (wet, transient) \$0.30/ft/ day				
33	Dupont Plaza Hotel Marina 300 Biscayne Blvd. Way	1000	ft.					Hotel Docks	(wet) \$0.20/ft/day		X	X	X
34	Atlantic Marine Boat Yard, Inc. 247 SW 5th St.	13				1	20 ton	Commercial Marina	(wet) \$100-\$125 / month (dry) \$3.50/ft/month				
35	8th Avenue Boat Slips 801 NW 4th Street	40						Commercial Marina	(wet) \$40-\$75/month				
36	Anacapri Yacht Basin 201 NW S. River Dr.	35						Commercial Marina	(wet, open) \$0.08/ft/day (wet, shed) \$0.09/ft/day				
37	Tony's Marine Service 243 NW S. River Dr.	20				1	30 ton	Commercial Marina	(wet) \$130-\$250/month				
38	Miami Pioneer Club 250 NW N River Dr.	28						Private Club					
39	Merrill Stevens Dry Dock Co. 1270 NW 11th Street	?				2	500 ton	Commercial Marina	(wet) \$0.20/ft/day		\$3.00/ ft	X	X
40	Muta's Boat Yard 1884 NW S. River Dr.	160				1 1 1	30 ton 12 ton 23 ft	Commercial Marina	(wet) \$0.0525/ft/day		\$1.50- \$2.00/ ft		

TABLE 12 (CONT'D)

NUMBER	NAME	NUMBER OF BERTHS		RAMP		HOISTS		TYPE OF FACILITY	CHARGES		FUEL	
		wet	dry	width (ft.)	floaton trailers	number	capacity		berths	ramp	hoist	gasoline reg. prem.
41	Hardie Yacht Basin 2100 NW N. River Dr.	100						Commercial Marina	(wet) \$0.06-\$0.07/ft/day			X
42	Poland Yacht Basin 2190 NW N. River Dr.	29				1		Commercial Marina				
43	Florida Yacht Basin 1585 NW 24th Ave	1800	ft.			1	90 ton	Commercial Marina	(wet) \$0.15-\$0.17/ft/day	\$2.00/ft		
44	Richard Bertram and Co. 3660 NW 21 St	150				1	100 ton	Commercial Marina	(wet, transient) \$0.25/ft/day (wet, monthly) \$0.20/ft/day	\$2.00/ft	X	X
45	Jones Boat Yard, Inc. 3399 NW S. River Dr.	4300	ft			1	200 ton	Commercial Marina	(wet) \$0.12/ft/day (wet, ehed) \$0.20/ft/day	\$2.00-\$2.50/ft		X
46	Coral Reef Yacht Club 2484 S. Bayshore Dr.	72	73			1	2 ton	Private Club				
47	Biscayne Bay Yacht Club 2540 S. Bayshore Dr.	56		12	yes	2 1	23 ft 30 ft	Private Club				
48	Monty Trainer's Bayshore Marina 2562 S. Bayshore Dr.							Commercial Marina	(wet) \$0.13/ft/day (wet, live-aboard) \$.15/ft/day			
49	City of Miami Boat Ramp 2564 Bayshore Dr.			44	yes			Public Boat Ramp (city)		Free		
50	Merrill Stevens Yacht Yard 2640 S. Bayshore Dr.	56	80			1	30 ton	Commercial Marina	(dry) \$0.18/ft/day (wet) \$0.17/ft/day	\$1.00-\$3.00/ft	X	X

TABLE 12 (CONT'D)

NUMBER	NAME	NUMBER OF BERTHS		RAMP		HOISTS		TYPE OF FACILITY	CHARGES			FUEL	
		wet	dry	width (ft.)	floston trailers	number	capa- city		berths	ramp	hoist	gasoline reg. prem.	diesel
51	Grove Key Marina 3385 Pan American Drive		250				2 ton 12 ton	Commercial (dry, rack) \$55-\$67/month (dry, inside) \$0.14/ft/day		\$10	X	X	
52	Dinner Key Marina Previously Underwood's	370	40					Public Marina					
53	Seminole Boat Service 2760 S. Bay Shore Drive			130	yes			Fuel Dock		free	X	X	
54	Coconut Grove Sailing Club McFrine Road	250 moor- ing	40			1 1	2 ton 1.5 ton	Private Club		free to members			
55	Crandon Park Marina Crandon Park	125		300	yes	1	10 ton	Public Marina (County)	\$0.05/ft/day	free	\$3.00	X	X
56	Key Biscayne Yacht Club 180 Harbor Dr. Key Biscayne	92	25	20	yes	1 1	2 ton 1 ton	Private Club		free to USPS	free	X	X
57	Matheson Hammock Marina Old Cutler Road	156		213	yes			Public Marina (County)	\$0.05/ft/day	free		X	X
58	Snapper Creek Marina 11190 Snapper Creek	29	10	12				Private Club					
59	Homestead AFB Docks	37	12	26	yes high tide only	-		Private Military	(wet) \$1.00/ft/month (dry, trailer) \$10/month				
60	Kings Bay Yacht and Country Club 14401 SW 62nd Ave	135				1	2 ton	Private Club			\$4.25	X	X

TABLE 12 (CONT'D)

NUMBER	NAME	NUMBER OF BERTHS		RAMP		HOISTS		TYPE OF FACILITY	CHARGES			FUEL	
		wet	dry	width (ft.)	floaton trailers	number	capacity		berths	ramp	hoist	gasoline reg. prep.	diesel
61	Florida Power & Light Docks	16						Private					
62	Pirates Spa 8701 SW 248 St.	16	37			1	4 ton	Commer- cial Marina	(wet) \$1.50/ft/month (dry, trailer) \$1.00/ft/month (dry, shed) \$30/month	\$3.50	X	X	X
63	Snapper Point Marina	15		50	yes			Commer- cial Marina	\$1.00/ft/month	\$1.00	X		X
64	Homestead Bayfront Park Canal Drive	72		90	yes	1	3 ton	Public Marina (County)	\$0.05/ft/day	free	\$3.00	X	X
65	Greens Place Card Sound Road	13		15				Commercial Marina	\$20/month	\$1.50			
66	Fred's Boats Card Sound Road	24		30	yes			Commercial Marina		free			

**Berth and Ramp Facilities
at Dade County Marinas**

<u>Site</u>	<u>No. Wet Berths</u>	<u>Linear Ramp Feet</u>	<u>Max. Car/Trailer Parking</u>
Haulover	-	300	145
North Bay	-	150	130
Crandon	125	300	266
Matheson	156	213	194
Homestead	72	90	167

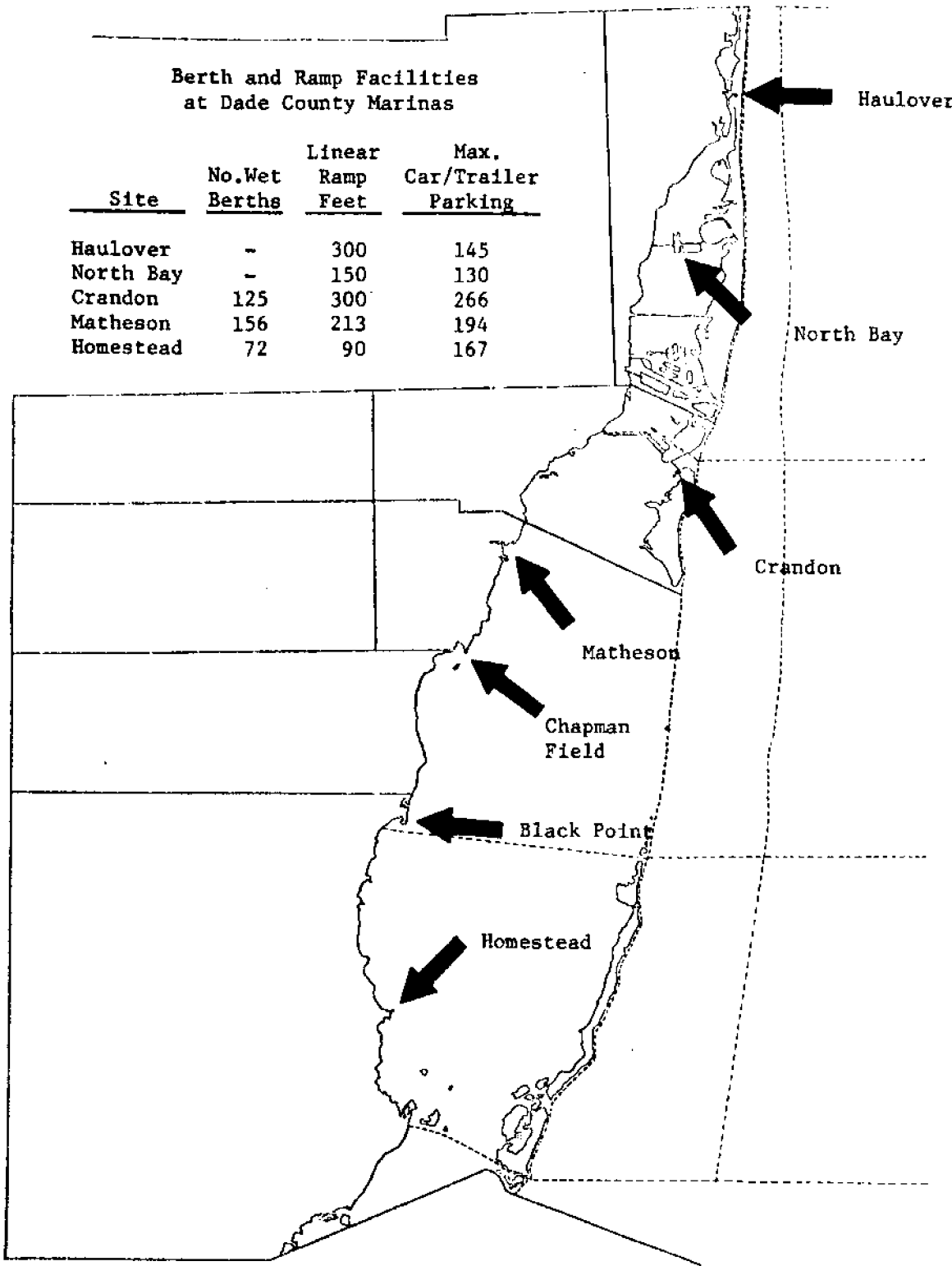


Figure 11. Location of existing and planned Dade County marinas.

dock operate from 0700 to 1730). Access to the ocean is limited by the 32-foot clearance of the fixed span of Haulover Bridge.

North Bay (79th St.) Boat Ramp

North Bay has paved parking for 15 car-trailer units with off-pavement parking for an additional 115 units (maximum of approximately 130 car-trailer units). The 150-foot wide ramp can accommodate approximately 12 boats simultaneously. There is no charge and the facility is open at all times.

Crandon Park Marina

Crandon has a ramp, hoist, wet berths, fuel dock (gas, diesel), limited sale of trip supplies, and a dockside restaurant. There is paved parking for 266 car-trailer units. The 300-foot wide ramp can accommodate approximately 23 boats simultaneously. The hoist can handle approximately 12 boats per hour. There are 125 wet berths with a navigable depth of 6 feet. There are 82 permanent mooring anchorages that are reached by private dinghies. There is no ramp charge, hoist is \$3.00 in-out, wet berths are five cents and anchorages four cents per foot per day. Ramp and wet berths are open at all times. Hoist, fuel dock, supplies, and restaurant operate from 0630 to 1700.

Matheson Hammock Park Marina

Matheson has a ramp, wet berths, fuel dock (gas, diesel), limited sale of trip supplies, and a snack bar at the swimming basin. There is paved parking for 124 car-trailer units in the main lot, another "overflow" lot that can accommodate 30 units, and off-pavement or non-assigned parking for approximately 40 units (maximum approximately 194 car-trailer units). The 213-foot wide ramp can accommodate approximately 16 boats simultaneously.

There are 156 wet berths with a navigable depth of 4.5 feet. There is no ramp charge; wet berths are five cents per foot per day. The entire park is closed from sunset to 0600.

Homestead Bayfront Park Marina

Homestead has a ramp, hoist, wet berths, fuel dock (gas), limited sale of trip supplies, and a snack bar at the swimming basin. There is paved parking for 116 car-trailer units at the ramp and 51 units at the hoist. The 90-foot wide ramp can accommodate approximately 7 boats simultaneously. The ramp is located north of the entrance to the harbor on land recently acquired by the National Park Service (U.S. Department of Interior) as the mainland operations base and departure point for the National Monument. The hoist is located south of the harbor entrance and can handle approximately 12 boats per hour. There are 72 wet berths with a navigable depth of 3 feet. There is no ramp charge, hoist is \$3.00 in-out, and wet berths are five cents per foot per day. The ramp is open at all times; wet berths are open from 0700 to sunset. Hoist, fuel dock, supplies, and restaurant operate from 0700 to 1800.

Characteristics of Boaters at County Marinas Compared to all Dade Boaters and Residents

Dade's boat owners are older, have been residents longer, more likely in single family homes, and they earn higher incomes than the Dade average (Table 13). There are no significant differences between boat owners who utilize county marinas (derived from site interview questionnaires) and the average boat owner (derived from written questionnaires to a sample of registered boaters). An important difference between boat owners and all Dade residents is the average number of years they have been residents.

TABLE 13
 SOCIO-ECONOMIC-DEMOGRAPHIC CHARACTERISTICS OF BOATERS IN DADE COUNTY

Boater	Characteristics	Boat Owners Utilizing		All Registered		Dade County Average
		Dade County Marinas	Dade County	Dade County ₂ Boat Owners	Dade County ₃ Average	
<u>Boater</u>	Age:					
	1-19(%)	1.1		1.6		32.3
	20-24(%)	6.0		4.5		7.0
	25-34(%)	27.0		19.5		11.6
	35-44(%)	24.4		28.1		12.4
	45-54(%)	22.1		26.4		12.5
	55-64(%)	13.8		13.8		10.6
65 + over(5)	5.6		6.1		13.6	
<u>Boater</u>	Average age		42.025		43.776	34.2
	Average years resident		17.967		19.390	
	Average family size		3.209		3.190	2.9
<u>Type Residence</u>	(by percent)					
	Apartment (%)	7.4		4.9		40.6
	Townhouse (%)	2.7		6.9		10.4 ⁵
	Condominium (%)	4.0		3.7		6.3
	Mobile home (%)	2.2		2.8		41.7
	Single family home (%)	83.5		80.9		1.0
	Other	.2		.8		

Type
Employment

(by percent) ⁴			
Trade	13.9	14.2	44.2
Technical	8.0	8.9	16.9 ⁶
Professional	33.4	28.7	
Management	11.9	13.0	7.6
Office/Clerical	5.9	5.7	24.5
Self-employed	14.4	17.0	unknown
Other	3.3	2.4	6.8
Retired	9.2	10.1	13.6

Income

(by percent
thousands of dollars)

0-5	1.01.7	22.1	
6-10	5.3	3.8	26.4
11-15	17.0	13.0	30.0
16-20	19.9	23.5	8.4
Over 20	56.7	57.2	13.1
Unknown	.1	.8	--

SOURCE:

- 1 Averaged over five county marinas from questionnaires dispersed with site interviews.
- 2 Estimated from questionnaires mailed to registered boaters.
- 3 1970 U.S. census data, except type residence, Dade County Planning Dept., 1975.
- 4 All figures % of labor force, except retired, % of population.
- 5 Includes townhouses and condominiums.
- 6 Includes technical and professional occupations.

This suggests that while one of the factors that may attract people to South Florida is the desirable coastal marine environment, new residents do not immediately purchase boats. This may have substantial implications for future boat ownership patterns. Even if Dade's population stabilizes, boat ownership will continue to grow if per capita ownership continues to increase with length of residency.

Table 14 indicates the municipalities in Dade County in which County marina boaters reside.

An interesting fact is that there is a relatively small number of "active" boaters (three to four thousand, which amounts to ten percent of all registered boat owners) who are responsible for most traffic at County marinas. Similarly, another three to four thousand boaters generate the non-County marina traffic. This implies that approximately seven to eight thousand boaters (20 percent of Dade registered boaters) are responsible for most of the recreational boating. These "active" boaters report using their boats approximately three times per month. If this is the case, then the majority of boaters (up to 80 percent) use their boats very infrequently.

Characteristics of Boats at County Marinas

Table 15 indicates the percentage of boats utilizing County marinas by length and year built. With regard to length, when this table is compared with Table 3 (registered boats by length and year built) it indicates proportionately fewer of the registered boats less than 16 feet use the marinas. This is probably because many of these small boats are used in fresh water. Proportionately more of the 16-25 foot boats use County marinas.

TABLE 14

PERCENT OF TRAFFIC AT COUNTY MARINAS FROM MUNICIPAL RESIDENCES

Municipality*	Haulover	North Bay	Crandon	Matheson	Homestead
Coral Gables	0.5	0.7	5.8	26.5	4.8
Golden Beach	0.0	0.0	0.0	0.0	0.0
Hialeah, Hialeah Gardens	8.4	10.3	15.6	2.1	1.8
Homestead, Florida City	0.0	0.0	0.4	0.3	44.7
Medley, Pennsuco	0.5	0.0	0.0	0.1	0.0
Miami	4.3	27.2	18.2	4.0	2.4
Miami Beach, North Bay Village	0.5	4.0	0.5	0.3	0.0
Miami Shores, El Portal, Biscayne Park	0.0	0.0	0.0	0.0	0.0
Miami Springs, Virginia Gardens	0.7	1.7	2.2	0.5	0.4
North Miami	22.6	13.6	2.7	0.6	0.1
North Miami Beach	5.2	1.7	0.4	0.2	0.1
Opa Locka	11.5	6.3	4.1	0.0	0.9
South Miami	0.0	0.0	2.3	14.0	1.4
Surfside, Bal Harbour, Bay Harbour, Indian Creek Village	1.1	0.7	0.1	0.0	0.2
Sweetwater	0.0	0.3	0.8	0.9	0.2
West Miami	0.7	0.7	2.6	0.9	0.5
Unincorporated Dade	26.6	27.8	36.4	47.8	37.1
Outside Dade	17.4	5.0	7.9	1.8	5.4
Total	100.0	100.0	100.0	100.0	100.0

SOURCE: Site interviews at marinas.

* Due to overlap of zip codes, some municipalities are combined.

TABLE 15
 PERCENT OF BOATS UTILIZING COUNTY MARINAS BY YEAR BUILT AND LENGTH

Row Percent Column Percent	Length					Row Total
	1'-15'	16'-20'	21'-25'	26'-39'	40' & over	
Year Built						
Before 1950	0.0	60.0	0.0	20.0	20.0	0.5
	0.0	0.6	0.0	0.8	2.0	
1950-54	0.0	33.3	0.0	33.3	33.3	0.3
	0.0	0.2	0.0	0.8	2.0	
1955-59	18.2	54.5	0.0	9.1	18.2	1.1
	3.8	1.3	0.0	0.8	4.0	
1960-64	19.6	43.5	21.7	10.9	4.3	4.7
	16.8	4.5	3.5	4.0	4.0	
1965-69	6.3	51.3	17.4	19.6	5.4	23.4
	26.0	26.1	13.8	34.9	24.5	
1970	3.7	46.3	31.7	11.0	7.3	8.6
	5.6	8.6	9.2	7.1	12.2	
1971	11.8	40.0	35.3	5.9	7.1	8.9
	18.5	7.7	10.6	4.0	12.2	
1972	4.5	40.5	36.9	10.8	7.2	11.7
	9.3	10.2	14.5	9.5	16.3	
1973	1.6	45.9	36.9	11.5	4.1	12.8
	3.7	12.7	15.9	11.1	10.2	
1974	3.5	46.0	33.6	13.3	3.5	11.9
	7.4	11.8	13.4	11.9	8.2	
1975	2.7	50.9	32.7	11.8	1.8	11.6
	5.6	12.7	12.7	10.3	4.1	
1976	5.0	35.0	45.0	15.0	0.0	4.2
	3.7	3.2	6.4	4.8	0.0	
Column Total	5.7	46.2	29.7	13.2	5.1	100.0

SOURCE: Responses to questionnaires dispersed at marinas.

With regard to age, as might be expected, newer boats (in each length category) use the marinas proportionately more frequently than older boats.

Table 16 indicates electronic equipment on boats by length. Short-wave radios are more prevalent than citizen band radios, but a substantial proportion of intermediate length boats have C.B. radios. C.B. radios are primarily in addition to, and not substituted for, shortwave radios.

The majority of recreational boating in Dade County (approximately 70 percent) is done by trailerable boat owners. Trends in registrations by length (Table 2) indicates the growing popularity of larger (16-25 foot) trailerable boats. Table 17 indicates the percentage of trailerable boats by size length at each County marina. Table 18 indicates the types and sizes (number of wheels) of trailers.

Desired Facilities at County Marinas

Tables 19 and 20 indicate the most desired changes that trailerable and berthed boat owners would like at each County marina. Berthed boat owners are most interested in security. Trailerable boat owners are concerned with more ramp and parking space. Ramp "space" does not necessarily refer to linear waterfront feet but ramps extending further into the water. The existing ramps were built before the expanded number of larger trailerable boats, which have launching and retrieval difficulties (particularly at low tide) because the ramps are too short. This problem can be expected to intensify with popularity of larger boats and float-on trailers.

Hurricane Plans at County Marinas and for all Dade Boaters

Almost all owners of trailerable boats report planning to keep their boats at home during a hurricane. Table 21 and Figure 12 indicate what

berthed boat owners plan to do in case of a hurricane. The primary hurricane protection points are locations in North Bay (primarily Little River), Miami River, and Coral Gables Waterway. At Crandon, Matheson, and Homestead a substantial percentage of owners report not knowing where they will go for hurricane protection. At Matheson and Homestead substantial percentages report they plan to remain at the marinas.

Daily Traffic Patterns at County Marinas

There is a well-established theory in recreational planning that recreators have established patterns of recreation with respect to time (season, weekend or weekday, time of day). Table 22 indicates departure and return times by offshore activity. A primary factor influencing the distribution of departures and returns for all activities over the day is the prevailing mix of activities which changes over the year. The prevailing mixes of activities in each season are one explanation of the departure and return patterns reflected in Figures 13 and 14. These "time curves" are an important component in estimating total daily boating activity (see Appendix II).

TABLE 16

PERCENT OF BOATS WITH ELECTRONIC EQUIPMENT BY LENGTH

Length	Boats Utilizing County Marinas ¹			All Dade ²		
	SW receiver & transmitter	CB radio	None	SW receiver & transmitter	CB radio	None
1-15	4.9	0.0	92.7	2.1	3.6	93.3
16-20	25.1	3.2	69.1	9.8	7.8	80.4
21-25	57.6	4.9	33.9	53.7	15.0	28.7
26-39	81.2	2.6	11.1	70.8	8.3	16.7
40 & over	89.4	0.0	10.6	73.3	20.0	0.0

SOURCES:

- 1 Estimated from questionnaires dispersed at marinas.
- 2 Estimated from questionnaire mailed to registered boaters.

TABLE 17

PERCENT OF BOATS BY LENGTH TRAILERED TO COUNTY MARINAS

Marina	Percent < 16'	Percent 16'-20'	Percent 21'-25'	Percent unknown
Haulover	7.5	63.2	28.1	1.3
North Bay	14.6	64.9	19.5	1.0
Crandon	9.1	62.6	27.5	.8
Matheson	6.8	58.7	32.2	2.2
Homestead	10.4	65.5	22.5	1.6

SOURCE: Site interviews at County marinas.

TABLE 18

PERCENT OF TRAILERS BY TYPE AND SIZE UTILIZING COUNTY MARINAS

Type Trailer	Percent
No trailer	.7
Standard	15.4
Break-away	72.5
Float-on	11.4
Electric winch	33.1
Size Trailer	
2 wheels	65.8
4 wheels	32.6
6 wheels	1.6

SOURCE: Site observations at County marinas, averaged over all five marinas.

TABLE 19
 DESIRED CHANGES IN FACILITIES AT COUNTY MARINAS, BY PREFERENCE FOR TRAILERED BOATS

Site	1st (%)	2nd (%)	3rd (%)	4th (%)
Haulover	More ramp space	More parking	More security	More ramp space
	34.9	40.0	28.6	15.0
	More security	More ramp space	More ramp space	More security
	25.3	14.3	21.4	More docks
North Bay	Ramp repair	More security	Ramp repair	Snack bar
	18.6	11.4	14.3	10.0
	More security	More parking	More ramp space	Longer hours
	30.8	31.6	27.3	24 hours
	More ramp space	More ramp space	More parking	General supplies
	25.6	26.3	24.2	More parking
	More parking	More security	More security	Dock repair
	10.3	13.2	12.1	More marinas
				Better fuel
				Ramp attendant
				Cleaning boards
				Non-boating
				Fishing pier
			5.0	
			Snack bar	
			11.5	
			Longer hours	
			More security	
			Ramp repair	
			Better Fuel	

TABLE 19 CONTINUED

Site	1st	2nd	3rd	4th
Crandon	More ramp space 32.4	More parking 18.9	More security 19.0	Fuel misc. 7.7
	More security 23.2	More ramp space 17.3	More parking 16.0	More ramp space
	Longer hours 9.9	More security 11.8	More ramp space 10.0	More docks
				Routine upkeep
				More parking
				Dock repair
				More marinas
				More hoists
				Channel markers
				Cleaning boards
Matheson	More ramp space 47.1	More parking 33.7	More parking 19.2	More security 10.5
	Longer hours 10.1	More ramp space 25.0	More security 13.8	More parking 9.8
	More parking 9.3	Ramp repair 7.9	More ramp space 11.8	More ramp space 6.5
				Longer hours 8.5
				Swimming 3.8

TABLE 19 CONTINUED

Site	1st	2nd	3rd	4th
Homestead	More ramp space 55.9	More parking 47.9	More security 25.2	More security 8.9
	More parking 15.2	More ramp space 19.8	More parking 13.9	24 hours 6.3
	More security 9.5	More security 6.3	More ramp space 11.9	Longer hours General supplies More parking Ramp repair More ramp docks Snack bar Other 5.4

SOURCE: Responses to written questionnaires dispersed at marinas.

TABLE 20

DESIRED CHANGES IN FACILITIES AT COUNTY MARINAS, BY PREFERENCE FOR BERTHED BOATS

Site	1st (%)	2nd (%)	3rd (%)	4th (%)
Crandon	More security	Longer hours	More security	General mechanic
	42.9	General mechanic	41.7	18.2
	More docks	Dock repair	General supplies	More security
	9.5	Diesel fuel	Food supplies	More ramp space
	Longer hours	11.8	More docks	More docks
	Food supplies	More security	More lighting	Ramp repair
	General supplies	More parking	Fuel-misc.	More fuel docks
	Tackle supplies	More docks	Fee rate	Payment method
	Better fuel	Bait supplies	Other	License boaters
	Diesel fuel	Mechanic on duty	8.3	Sleep aboard
	Fee structure	Routine upkeep		Restaurant
	Dock repair	Better fuel		9.1
	Mechanic	More fuel docks		
	4.8	Non-boating		
	5.9			
Matheson	More security	More security	Other	Restaurant
	27.5	14.0	14.7	14.3
	Longer hours	Fee structure	Restaurant	More docks
	17.6	9.3	More security	Fee rate
	24 hours	More ramp space	More docks	Channel markers
	7.8	More fuel docks	8.8	Deepen channel
		Fuel-misc.	Better fuel	Snack bar
		Sleep aboard	Night-MB	9.5
		7.0	More fuel docks	More security
			24 hours	More parking

TABLE 20 CONTINUED

Site	1st	2nd	3rd	4th
			5.9	More ramp space Dock repair More marinas Fee structure Sleep aboard 24 Hr electricity 4.8
Homestead	More security 37.9 Longer hours 24 hours More ramp space Diesel fuel Fee rate 6.9 Earlier hours Routine upkeep More parking More docks Better fuel Deeper channel Sleep aboard 24 hour electricity 3.4	More security 14.3 More parking More fuel docks General mechanic Deepen channel 10.7 More docks Better fuel Fee rate 7.1	More parking Deepen channel 11.8 Longer hours Later hours Earlier hours General supplies Bait supplies Tackle supplies More security Dock repair Mechanic on duty More fuel docks Fee structure License boaters 24 hour electricity 5.9	Deepen channel 33.3 Fuel docks Fee structure More ramp space More parking More security 24 hours 11.1

SOURCE: Responses to written questionnaires dispersed at marinas.

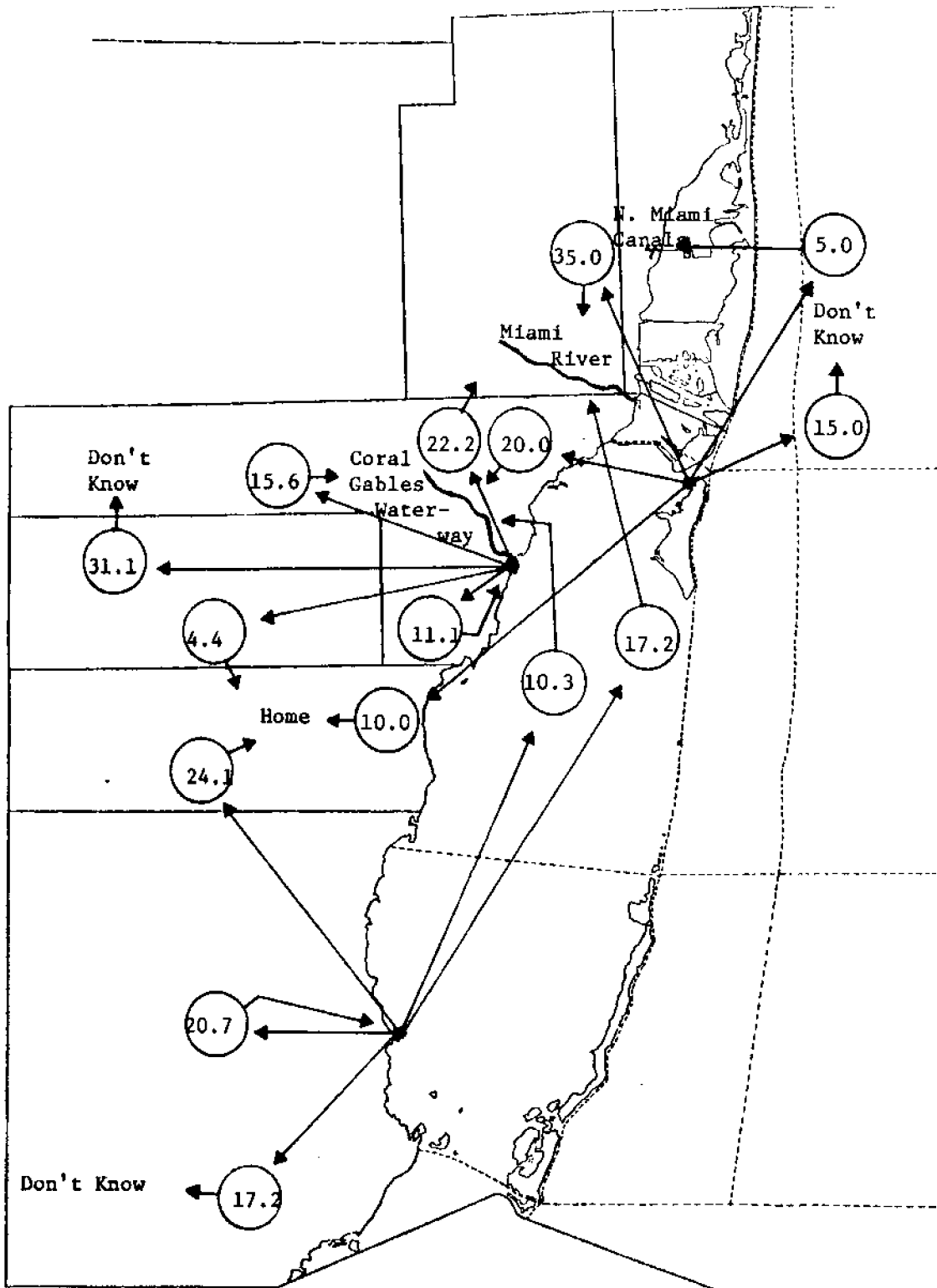


Figure 12. Hurricane plans by percent of berthed boats at county marinas. (estimated from questionnaires dispersed at marinas)

TABLE 21
HURRICANE EVACUATION PLANS BY PERCENT OF BOATS FOR ALL BERTHED
BOATS IN DADE COUNTY

Anticipated Hurricane Port	County Marinas			All Dade County Marinas
	Crandon	Matheson	Homestead	
Miami River	35.0	22.2	17.2	25.5
Gables Waterway	20.0	15.6	10.3	15.7
North M. Waterway	5.0	0.0	0.0	2.0
Marina	0.0	11.1	20.7	13.7
Home	10.0	4.4	24.1	31.4
Other	15.0	15.6	10.3	5.9
Don't Know	15.0	31.1	17.2	5.9

SOURCE: Responses to written questionnaires dispersed at marinas.

Trailerable Boat Capacities at County Marinas

Knowledge of the distribution of departures and returns over the day, as well as expected total traffic, is necessary for evaluating trailerable boat capacity at each marina. Since the distribution of traffic is dependent on the prevailing mix of activities, which is in turn related to the season of the year, daily trailerable boat capacities vary over the year. Capacities are calculated for each site based on summer activity mixes because this is when there is the most total traffic.

There are two trailerable boat capacity restrictions at each marina. First, the number of car-trailer parking spaces. Second, the number of boats that can be accommodated by the ramp and hoist per unit of time. The parking requirements in each time period (defined in two-hour intervals) is the cumulative departures minus returns (D-R in Figure 14,

TABLE 22
DEPARTURE AND RETURN TIMES BY OFFSHORE ACTIVITY FOR ALL SEASONS
(Percent Departures and Returns by Activity)

Time of Day	Cruise			Surface Contact			Dive/Spearfish			
	b	R	D	b	R	D	b	R	D	
Pre 0600	.8	0	.8	.3	0	.3	.6	0	.6	0
0600-0800	2.5	0	3.3	.6	0	.9	13.1	0	13.7	0
0800-1000	13.5	0	16.8	18.3	0	19.2	42.6	0	56.3	0
1000-1200	35.4	3.4	52.2	37.5	1.2	56.7	29.8	1.9	86.1	1.9
1200-1400	29.1	12.4	81.3	31.9	9.9	88.6	9.7	13.1	95.8	15.0
1400-1600	14.0	29.1	95.3	9.0	25.1	97.6	2.8	32.9	98.6	47.9
1600-1800	3.1	41.5	98.4	1.5	46.7	99.1	.3	39.6	98.9	87.5
Post 1800	1.6	13.6	100.0	.9	17.1	100.0	1.1	12.5	100.0	100.0

Time of Day	Linefish			Other		
	b	R	D	b	R	D
Pre 0600	1.8	.1	1.8	7.0	.4	7.0
0600-0800	25.5	.1	27.3	3.1	2.0	10.1
0800-1000	35.9	.1	63.2	18.1	2.5	28.2
1000-1200	20.4	5.6	83.6	14.2	6.5	42.4
1200-1400	8.3	20.1	91.9	10.3	8.9	52.7
1400-1600	2.9	34.6	94.8	18.3	24.8	71.0
1600-1800	1.3	28.8	96.1	4.4	22.8	75.4
Post 1800	3.8	10.6	99.9	24.6	32.1	100.0

SOURCE: Average of five County marinas from site interviews.

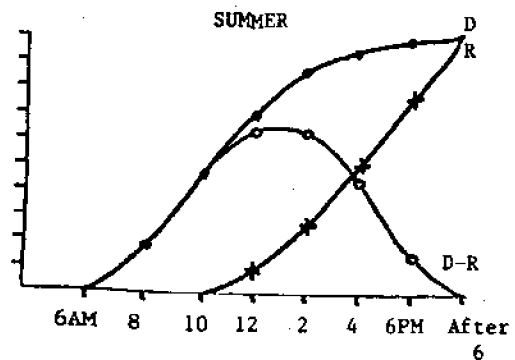
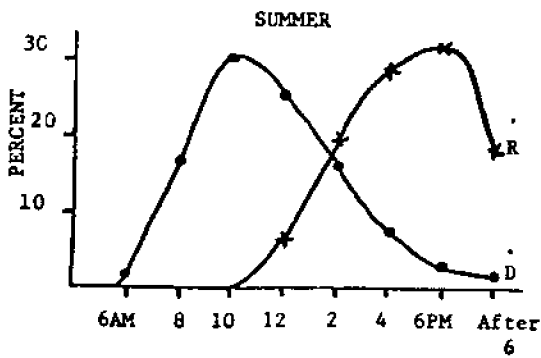
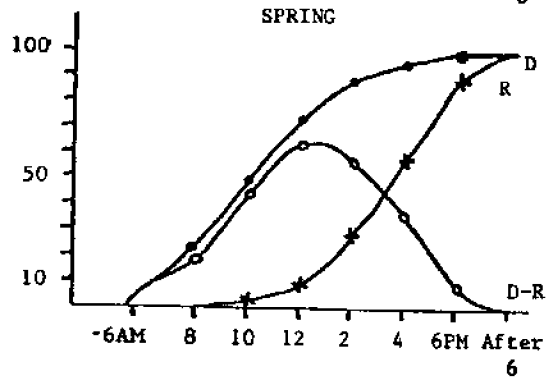
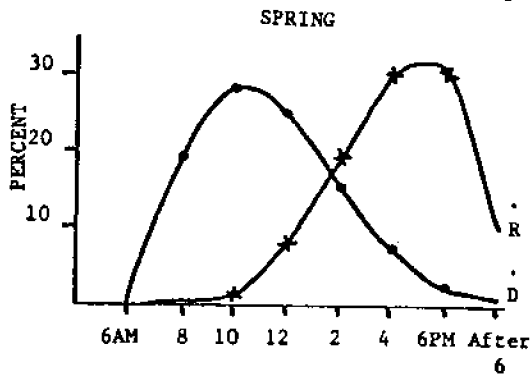
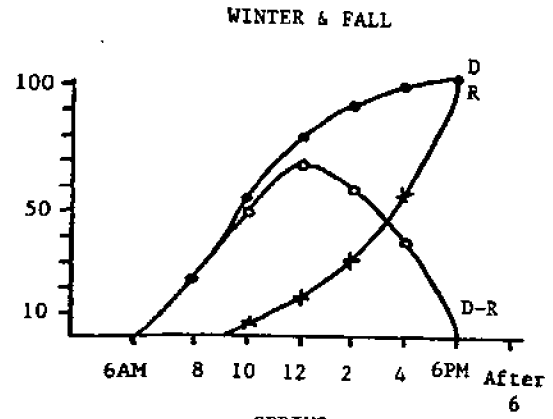
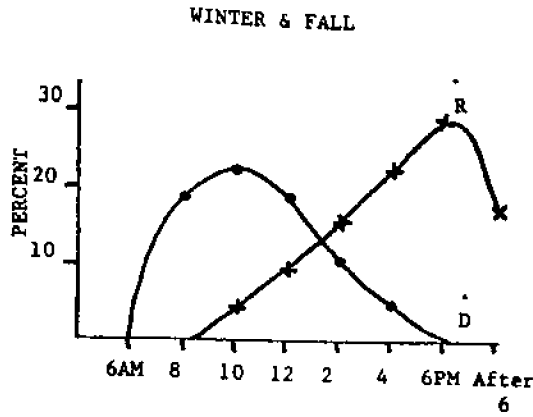


Figure 13. Percent of departures (D) and returns (R) by time of day by season for all activities at county marinas.

Figure 14. Cumulative percent of departures (D) and returns (R) by time of day by season for all activities at county marinas.

times total daily traffic). The ramp and hoist requirements in each time period (same two-hour intervals) are based on the number of departures plus the number of returns in each time period (D+R in Figure 13, times total daily traffic).

Tables 23-27, cumulative departures minus cumulative returns (D-R), indicate the required parking capacity during the two-hour interval because this is the number of boaters that are offshore. Departures plus returns (D+R) indicates the number of boats the ramp and hoist must be capable of accommodating during the two-hour interval. Parking capacities are based on the existing facilities at each site (see Existing Sites and Table 13). Ramp capacity is predicated on a trailerable boat requiring 13.5 linear waterfront feet for ten minutes to launch or retrieve a boat. At the two sites where there are hoists (Crandon and Matheson), the hoist capabilities (assumed to be 12 boats per hour) are added to ramp capabilities.

At all sites parking is more constraining than ramp/hoist accommodations. However, ramp congestion does occur at peak times, partly because the distance the ramps extend into the water, the number and length of finger piers, and the general condition of ramps prohibit maximum utilization of the existing linear waterfront feet.

TABLE 23

PARKING AND RAMP CAPACITY AT HAULOVER

Daily Number of Boats Serviced*	Pre 0600		0600-0800		0800-1000		1000-1200		1200-1400		1400-1600		1600-1800		Post 1800	
	D-R	D+R	D-R	D+R	D-R	D+R	D-R	D+R	D-R	D+R	D-R	D+R	D-R	D+R	D-R	D+R
100	2	2	17	15	47	30	68	31	68	33	45	36	15	43		19
125	3	3	21	19	59	38	84	39	83	41	56	44	19	43		23
150	3	3	26	23	71	45	101	47	100	49	67	53	22	52		28
175	4	4	30	27	83	53	118	54	117	57	78	62	26	61		32
200	4	4	35	31	95	60	135	62	133	66	90	71	30	69		37
225	5	5	39	35	107	68	151	70	150	74	101	80	34	78		42
250	5	5	44	39	119	75	168	78	167	82	112	89	37	87		46
275	6	6	48	42	130	83	185	86	183	90	123	98	41	95		51
300	6	6	52	46	142	90	202	93	200	98	134	107	45	104		56
325	7	7	57	50	154	98	219	101	217	107	146	115	48	113		60
350	7	7	61	54	166	105	236	109	233	115	157	124	52	121		65
375	8	8	65	58	178	113	252	117	250	123	168	133	56	130		69
400	8	8	70	62	190	120	269	124	267	131	179	142	60	139		74
425	9	9	74	65	201	128	286	132	283	139	190	151	63	147		79
450	9	9	78	69	213	135	303	140	300	148	202	160	67	156		83
475	10	10	83	73	225	143	320	148	317	156	213	169	71	165		88
500	10	10	87	77	237	150	337	156	333	164	224	178	75	174		93
525	11	11	91	81	249	158	353	163	350	172	235	186	78	182		97
550	11	11	96	85	260	165	370	171	367	180	246	195	82	191		102
575	12	12	100	89	273	173	387	179	383	189	258	204	86	200		106
600	12	12	104	92	284	180	404	187	400	197	269	213	89	208		111
625	13	13	109	96	296	188	421	194	417	205	280	222	93	217		116
650	13	13	113	100	308	195	437	202	433	213	291	231	97	226		120
675	14	14	117	104	320	203	454	210	450	221	302	240	101	234		125
700	14	14	122	108	332	210	471	218	467	230	314	249	104	243		130

Source: Based on summer activity mix and resulting time curves.
 Legend: paved parking capacity —————
 unpaved parking capacity ** * * * * *
 ramp capacity - - - - -

TABLE 24

PARKING AND RAMP CAPACITY AT NORTH BAY

Daily Number of Boats Serviced*	Pre 0600		0600-0800		0800-1000		1000-1200		1200-1400		1400-1600		1600-1800		Post 1800	
	D-R	D+R	D-R	D+R	D-R	D+R	D-R	D+R	D-R	D+R	D-R	D+R	D-R	D+R	D-R	D+R
100	2	2	17	15	47	30	68	31	68	33	45	36	15	43		19
125	3	3	21	19	59	38	84	39	83	41	56	44	19	43		23
150	3	3	26	23	71	45	101	47	100	49	67	53	22	52		28
175	4	4	30	27	83	53	118	54	117	57	78	62	26	61		32
200	4	4	35	31	95	60	135	62	133	66	90	71	30	69		37
225	5	5	39	35	107	68	151	70	150	74	101	80	34	78		42
250	5	5	44	39	119	75	168	78	167	82	112	89	37	87		46
275	6	6	48	42	130	83	185	86	183	90	123	98	41	95		51
300	6	6	52	46	142	90	202	93	200	98	134	107	45	104		56
325	7	7	57	50	154	98	219	101	217	107	146	115	48	113		60
350	7	7	61	54	166	105	236	109	233	115	157	124	52	121		65
375	8	8	65	58	178	113	252	117	250	123	168	133	56	130		69
400	8	8	70	62	190	120	269	124	267	131	179	142	60	139		74
425	9	9	74	65	201	128	286	132	283	139	190	151	63	147		79
450	9	9	78	69	213	135	303	140	300	148	202	160	67	156		83
475	10	10	83	73	225	143	320	148	317	156	213	169	71	165		88
500	10	10	87	77	237	150	337	156	333	164	224	178	75	174		93
525	11	11	91	81	249	158	353	163	350	172	235	186	78	182		97
550	11	11	96	85	260	165	370	171	367	180	246	195	82	191		102
575	12	12	100	89	273	173	387	179	383	189	258	204	86	200		106
600	12	12	104	92	284	180	404	187	400	197	269	213	89	208		111
625	13	13	109	96	296	188	421	194	417	205	280	222	93	217		116
650	13	13	113	100	308	195	437	202	433	213	291	231	97	226		120
675	14	14	117	104	320	203	454	210	450	221	302	240	101	234		125
700	14	14	122	108	332	210	471	218	467	230	314	249	104	243		130

Source: Based on summer activity mix and resulting time curves.

Legend: unpaved parking capacity * * * * *
ramp capacity - - - - -

TABLE 25

PARKING AND RAMP/HOIST CAPACITY AT CRANDON

Daily Number of Boats Serviced*	Pre 0600		0600-0800		0800-1000		1000-1200		1200-1400		1400-1600		1600-1800		Post 1800	
	D-R	D+R	D-R	D+R	D-R	D+R	D-R	D+R	D-R	D+R	D-R	D+R	D-R	D+R	D-R	D+R
100	2	2	17	15	47	30	68	31	68	33	45	36	15	43		19
125	3	3	21	19	59	38	84	39	83	41	56	44	19	43		23
150	3	3	26	23	71	45	101	47	100	49	67	53	22	52		28
175	4	4	30	27	83	53	118	54	117	57	78	62	26	61		32
200	4	4	35	31	95	60	135	62	133	66	90	71	30	69		37
225	5	5	39	35	107	68	151	70	150	74	101	80	34	78		42
250	5	5	44	39	119	75	168	78	167	82	112	89	37	87		46
275	6	6	48	42	130	83	185	86	183	90	123	98	41	95		51
300	6	6	52	46	142	90	202	93	200	98	134	107	45	104		56
325	7	7	57	50	154	98	219	101	217	107	146	115	48	113		60
350	7	7	61	54	166	105	236	109	233	115	157	124	52	121		65
375	8	8	65	58	178	113	252	117	250	123	168	133	56	130		69
400	8	8	70	62	190	120	269	124	267	131	179	142	60	139		74
425	9	9	74	65	201	128	286	132	283	139	190	151	63	147		79
450	9	9	78	69	213	135	303	140	300	148	202	160	67	156		83
475	10	10	83	73	225	143	320	148	317	156	213	169	71	165		88
500	10	10	87	77	237	150	337	156	333	164	224	178	75	174		93
525	11	11	91	81	249	158	353	163	350	172	235	186	78	182		97
550	11	11	96	85	260	165	370	171	367	180	246	195	82	191		102
575	12	12	100	89	273	173	387	179	383	189	258	204	86	200		106
600	12	12	104	92	284	180	404	187	400	197	269	213	89	208		111
625	13	13	109	96	296	188	421	194	417	205	280	222	93	217		116
650	13	13	113	100	308	195	437	202	433	213	291	231	97	226		120
675	14	14	117	104	320	203	454	210	450	221	302	240	101	234		125
700	14	14	122	108	332	210	471	218	467	230	314	249	104	243		130

Source: Based on summer activity mix and resulting time curves.

Legend: paved parking capacity —————
ramp and hoist capacity - - - - -

TABLE 26

PARKING AND RAMP CAPACITY AT MATHESON

Daily Number of Boats Serviced*	Pre 0600		0600-0800		0800-1000		1000-1200		1200-1400		1400-1600		1600-1800		Post 1800	
	D-R	D+R	D-R	D+R	D-R	D+R	D-R	D+R	D-R	D+R	D-R	D+R	D-R	D+R	D-R	D+R
100	2	2	17	15	47	30	68	31	68	33	45	36	15	43		19
125	3	3	21	19	59	38	84	39	83	41	56	44	19	43		23
150	3	3	26	23	71	45	101	47	100	49	67	53	22	52		28
175	4	4	30	27	83	53	118	54	117	57	78	62	26	61		32
200	4	4	35	31	95	60	135	62	133	66	90	71	30	69		37
225	5	5	39	35	107	68	151	70	150	74	101	80	34	78		42
250	5	5	44	39	119	75	168	78	167	82	112	89	37	87		46
275	6	6	48	42	130	83	185	86	183	90	123	98	41	95		51
300	6	6	52	46	142	90	202	93	200	98	134	107	45	104		56
325	7	7	57	50	154	98	219	101	217	107	146	115	48	113		60
350	7	7	61	54	166	105	236	109	233	115	157	124	52	121		65
375	8	8	65	58	178	113	252	117	250	123	168	133	56	130		69
400	8	8	70	62	190	120	269	124	267	131	179	142	60	139		74
425	9	9	74	65	201	128	286	132	283	139	190	151	63	147		79
450	9	9	78	69	213	135	303	140	300	148	202	160	67	156		83
475	10	10	83	73	225	143	320	148	317	156	213	169	71	165		88
500	10	10	87	77	237	150	337	156	333	164	224	178	75	174		93
525	11	11	91	81	249	158	353	163	350	172	235	186	78	182		97
550	11	11	96	85	260	165	370	171	367	180	246	195	82	191		102
575	12	12	100	89	273	173	387	179	383	189	258	204	86	200		106
600	12	12	104	92	284	180	404	187	400	197	269	213	89	208		111
625	13	13	109	96	296	188	421	194	417	205	280	222	93	217		116
650	13	13	113	100	308	195	437	202	433	213	291	231	97	226		120
675	14	14	117	104	320	203	454	210	450	221	302	240	101	234		125
700	14	14	122	108	332	210	471	218	467	230	314	249	104	243		130

Source: Based on summer activity mix and resulting time curves.

Legend: paved parking capacity _____
 unpaved parking capacity ** ** ** **
 ramp capacity - - - - -

TABLE 27

PARKING AND RAMP/HOIST CAPACITY AT HOMESTEAD

Daily Number of Boats Serviced*	Pre 0600		0600-0800		0800-1000		1000-1200		1200-1400		1400-1600		1600-1800		Post 1800	
	D-R	D+R	D-R	D+R	D-R	D+R	D-R	D+R	D-R	D+R	D-R	D+R	D-R	D+R	D-R	D+R
100	2	2	17	15	47	30	68	31	68	33	45	36	15	43		19
125	3	3	21	19	59	38	84	39	83	41	56	44	19	43		23
150	3	3	26	23	71	45	101	47	100	49	67	53	22	52		28
175	4	4	30	27	83	53	118	54	117	57	78	62	26	61		32
200	4	4	35	31	95	60	135	62	133	66	90	71	30	69		37
225	5	5	39	35	107	68	151	70	150	74	101	80	34	78		42
250	5	5	44	39	119	75	168	78	167	82	112	89	37	87		46
275	6	6	48	42	130	83	185	86	183	90	123	98	41	95		51
300	6	6	52	46	142	90	202	93	200	98	134	107	45	104		56
325	7	7	57	50	154	98	219	101	217	107	146	115	48	113		60
350	7	7	61	54	166	105	236	109	233	115	157	124	52	121		65
375	8	8	65	58	178	113	252	117	250	123	168	133	56	130		69
400	8	8	70	62	190	120	269	124	267	131	179	142	60	139		74
425	9	9	74	65	201	128	286	132	283	139	190	151	63	147		79
450	9	9	78	69	213	135	303	140	300	148	202	160	67	156		83
475	10	10	83	73	225	143	320	148	317	156	213	169	71	165		88
500	10	10	87	77	237	150	337	156	333	164	224	178	75	174		93
525	11	11	91	81	249	158	353	163	350	172	235	186	78	182		97
550	11	11	96	85	260	165	370	171	367	180	246	195	82	191		102
575	12	12	100	89	273	173	387	179	383	189	258	204	86	200		106
600	12	12	104	92	284	180	404	187	400	197	269	213	89	208		111
625	13	13	109	96	296	188	421	194	417	205	280	222	93	217		116
650	13	13	113	100	308	195	437	202	433	213	291	231	97	226		120
675	14	14	117	104	320	203	454	210	450	221	302	240	101	234		125
700	14	14	122	108	332	210	471	218	467	230	314	249	104	243		130

Source: Based on summer activity mix and resulting time curves.

Legend: paved parking capacity ————
ramp and hoist capacity - - - - -

TRIPS, ACTIVITIES, AND DESTINATIONS

Recreational Boating Trips in Dade County

It is estimated that in 1975-76 there were approximately 259,992 recreational boating trips in Dade County (Table 28). Of this total, 54.5 percent, or 141,780 trips, originated from the five County marinas. Fall was the season with the least activity. Total trips increased constantly and reached a peak in the summer. Crandon was the busiest of the County marinas for the year, followed closely by Matheson (in two seasons Matheson had more trips than Crandon).

Table 28 provides a breakdown of trips by County marina, total Dade boating trips, and weekday and weekend day average daily trips. The percentage of total activity originating at County marinas varies from season to season.

Offshore Recreational Boating Activities

Offshore activities are divided into ten categories: 1) cruising; 2) surface contact (primarily swimming/skiing); 3) diving; 4) line fishing; 5) spearfishing; 6) hand fishing; 7) commercial fishing; 8) business related; 9) land and picnicking; 10) other.* For purposes of analysis, these 10 activities were grouped into 5 categories: 1) cruising and land activity; 2) surface contact; 3) line fishing; 4) diving and spearfishing; 5) other: hand fishing, commercial fishing, business activity and other.

* Sailing is included in cruising.

TABLE 28

1975-76 RECREATIONAL BOATING TRIPS IN DADE COUNTY

	<u>Average Daily Trips Per Season</u>							County Marinas All Dade
	Haul- over	North Bay	Cran- don	Mathe- son	Home- stead	County Marinas	All Dade	
<u>Winter</u> (Jan-March)								
weekday	15 ¹	10 ¹	47 ¹ 7 ²	37 ¹ 14 ²	26 ¹ 6 ²	135 ¹ 27 ²	278 ³	.583
weekend day	57	51	166 25	158 63	103 26	535 114	998	.650
<u>Spring</u> (April-June)								
weekday	42	30	74 12	59 26	63 18	268 56	619	.523
weekend day	160	92	180 28	129 58	149 43	710 129	1321	.635
<u>Summer</u> (July-Sept)								
weekday	33	27	120 13	79 36	76 12	335 61	838	.473
weekend day	127	83	345 37	219 101	232 37	1006 175	2176	.543
<u>Fall</u> (Oct-Dec)								
weekday	10	10	32 6	38 19	12 5	102 30	265	.498
weekend day	40	35	114 23	112 56	49 21	350 100	837	.538
<u>Total Monthly Trips Per Season</u>								
<u>Winter</u>	786	628	2357 359	2069 821	1385 351	7225 1531	14,103	.621
<u>Spring</u>	2204	1396	3076 480	2322 1044	2571 747	11569 2271	24,186	.572
<u>Summer</u>	1742	1258	5397 585	3490 1600	3530 558	15417 2743	35,851	.507
<u>Fall</u>	540	500	1608 324	1738 860	654 280	5040 1464	12,524	.519
<u>Total Annual Trips</u>								
	15,816	11,346	37,314 5244	28,857 12,975	24,420 5808	117,753 24,027	259,992	.545

SOURCE: Site observations at County marinas and aerial boat census.

¹ Trailered boats² Berthed boats³ All Dade figures include both trailered and berthed boats

Table 29 indicates the second and third most frequent activities for each primary activity. Line fishing appears as the second or third choice for all activities. Those whose primary activities relate to direct contact with the water (surface contact, skin dive, SCUBA dive, spearfish) indicate strong preferences for other forms of water sports for their second and third choices. Some form of direct contact with the water is indicated as the second or third choice for all activities.

Table 30 indicates reported trips per month in winter and summer by activity. As would be expected, surface contact, skin dive, SCUBA diving, and spearfishing are more concentrated in the summer than cruising or line fishing.

Trips by Activities and Destinations

Marinas can be viewed as intermediate steps between where boaters reside and their offshore destinations. Therefore, site locations for marinas should consider both proximity to residence areas and proximity to offshore destination areas.

Recreational boating in Dade County is dependent on numerous desirable natural resources as well as marine facilities and other ancillary commodities and services that support (and are supported by) recreational boating. How recreational boaters affect the natural marine environment is not well known (except occasionally in the case of fishing). The first step in ascertaining the environmental impact of recreational boating is to obtain information about how intensely areas and resources are utilized by recreational boaters.

In terms of matching offshore areas with activities, west to east or bay-reef-stream, distinctions are more meaningful than north to south distinctions. In general, the north to south distinction is determined by

the marina departure site (and residence area), while the west to east distinction is determined by the activity. Figures 15-18 indicate the estimated number of total trips to each offshore area by activity for each season. Figure 19 indicates total seasonal and total annual trips to each offshore area by activity. These estimates were calculated by combining marina site interview data with aerial boat census (see Appendix II).

Cruising is concentrated in the bay, particularly in the winter when seas are rougher offshore. Surface contact sports (swimming, waterskiing) are also concentrated in the bay. Diving and spearfishing are concentrated in the reef areas. Line fishing occurs in all areas and is such an important activity (45 percent of all boating) that it is treated as a separate topic in this study.

TABLE 29
OFFSHORE ACTIVITY PATTERNS

Primary Activity	First Most Frequent Secondary Activity	Second Most Frequent Secondary Activity
Cruising	Linefish (36.6%)	Surface contact (27.3%)
Surface contact	Skindive (31.0%)	Linefish (29.3%)
Skindive	Linefish (25.8%)	Scuba dive (22.6%)
Scuba dive	Skindive (60.9%)	Linefish (17.4%)
Spearfish	Skindive (46.7%)	Linefish (26.7%)
Linefish	Cruising (33.7%)	Surface contact (22.4%)

SOURCE: Estimated from questionnaires dispersed at marinas.

TABLE 30

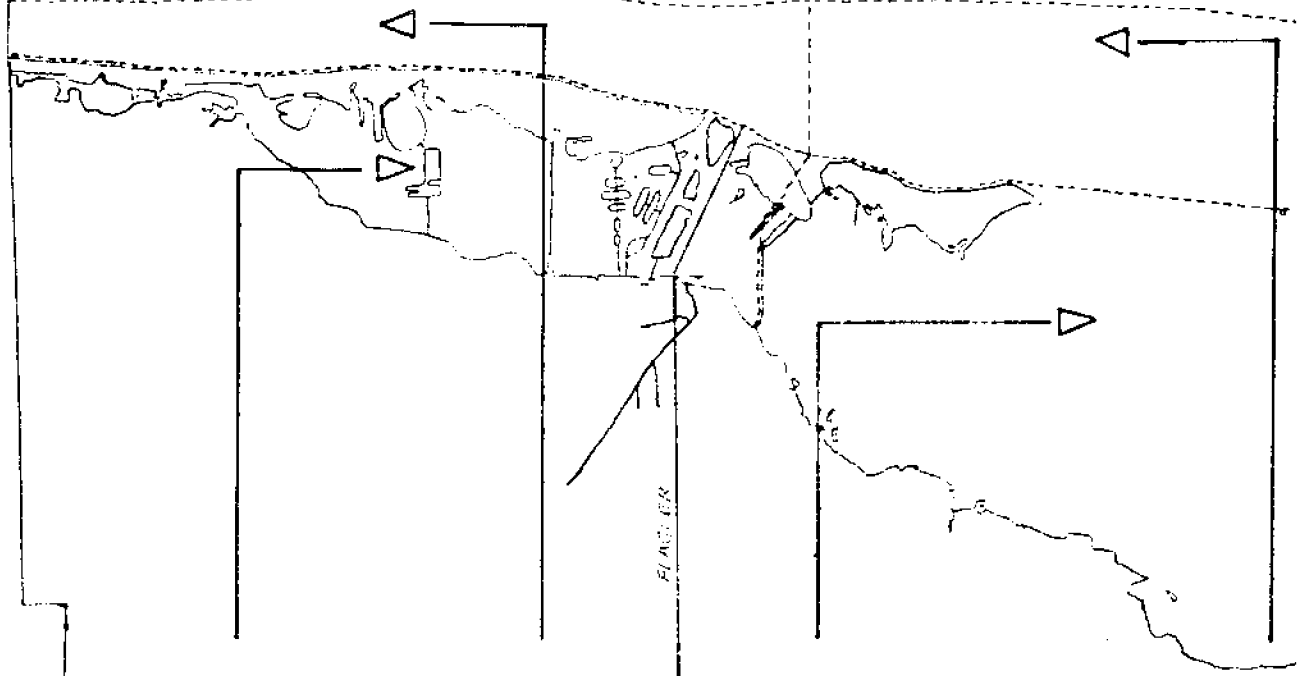
TRIPS PER MONTH BY BOATERS ACCORDING TO PRIMARY
BOATING ACTIVITY AND SEASON

Activity	Average Trips per Month by Boaters Using County Marinas ¹ (std. dev.)		Average Trips per Month by All Dade Boaters ² (std. dev.)	
	Winter	Summer	Winter	Summer
Cruising	4.3 (7.0)	5.1 (5.7)	3.9 (3.8)	5.2 (4.5)
Picnic/land	3.0 (0.0)	4.0 (0.0)		
Surface Contact	4.1 (3.8)	7.7 (8.7)	3.4 (2.6)	5.1 (3.8)
Skin Dive	4.5 (4.1)	4.5 (2.5)	4.0 (5.9)	8.9 (15.0)
Scuba Dive	3.2 (2.4)	5.7 (2.9)	2.0 (0.0)	3.3 (0.6)
Spearfish	4.2 (3.6)	7.4 (5.4)	2.5 (2.4)	3.5 (1.9)
Line Fish	4.1 (3.6)	5.2 (4.0)	3.5 (3.1)	4.5 (4.6)
Commercial Fish	17.6 (8.9)	17.4 (11.0)		
Business	4.0 (3.2)	4.7 (3.4)	4.7 (3.4)	4.7 (2.5)
Other	3.8 (2.6)	4.7 (2.3)	8.7 (9.9)	7.3 (11.0)

SOURCE:

¹ Estimated from questionnaires dispersed at marinas.

² Estimated from questionnaires mailed to registered boaters.



Activity	Percent	Avg. Trips Week day	Avg. Trips Weekend day	Monthly Total
Cruise	37.6	34.0	139.8	1666
Swim/Ski	18.2	10.8	44.2	591
Linefish	21.2	12.5	51.4	686
Dive/Spear	6.0	0.0	0.0	0
Other	3.0	1.8	7.3	98
Total	100.0	59.1	242.7	3241

Activity	Percent	Avg. Trips Week day	Avg. Trips Weekend day	Monthly Total
Cruise	4.2	1.1	2.0	40
Swim/Ski	0.0	0.0	0.0	0
Linefish	91.6	22.6	44.5	858
Dive/Spear	0.0	0.0	0.0	0
Other	4.2	1.1	2.0	40
Total	100.0	25.0	48.5	938

Activity	Percent	Avg. Trips Week day	Avg. Trips Weekend day	Monthly Total
Cruise	46.1	26.2	162.2	1918
Swim/Ski	1.7	2.3	13.0	155
Linefish	47.1	28.8	165.7	1959
Dive/Spear	0.8	0.5	2.8	33
Other	2.3	1.4	8.1	96
Total	100.0	61.2	351.8	4161

Activity	Percent	Avg. Trips Week day	Avg. Trips Weekend day	Monthly Total
Cruise	13.8	1.0	4.4	57
Swim/Ski	0.0	0.0	0.0	0
Linefish	77.2	5.3	24.5	313
Dive/Spear	9.0	0.6	2.8	36
Other	0.0	0.0	0.0	0

Activity	Percent	Avg. Trips Week day	Avg. Trips Weekend day	Monthly Total
Cruise	11.1	4.5	6.7	153
Swim/Ski	0.0	0.0	0.0	0
Linefish	88.9	35.7	53.7	1215
Dive/Spear	0.0	0.0	0.0	0
Other	0.0	0.0	0.0	0
Total	100.0	40.2	60.4	1368

Activity	Percent	Avg. Trips Week day	Avg. Trips Weekend day	Monthly Total
Cruise	5.1	1.3	2.2	66
Swim/Ski	0.0	0.0	0.0	0
Linefish	94.9	25.0	40.1	871
Dive/Spear	0.0	0.0	0.0	0
Other	0.0	0.0	0.0	0
Total	100.0	26.3	42.3	917

Total 100.0 6.9 31.7 606

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Activity	Percent	Avg. Trips Week day	Avg. Trips Weekend day	Monthly Total
Cruise	44.0	13.1	86.3	819
Swim/Ski	7.5	2.2	31.3	139
Linefish	43.3	13.5	68.2	643
Dive/Spear	2.4	0.8	3.6	46
Other	0.8	0.3	1.2	16
Total	100.0	29.9	150.6	1863

Activity	Percent	Avg. Trips Week day	Avg. Trips Weekend day	Monthly Total
Cruise	3.5	0.4	1.2	18
Swim/Ski	0.0	0.0	0.0	0
Linefish	83.5	8.9	27.6	417
Dive/Spear	13.0	1.4	4.3	65
Other	0.0	0.0	0.0	0
Total	100.0	10.7	33.1	500

Activity	Percent	Avg. Trips Week day	Avg. Trips Weekend day	Monthly Total
Cruise	22.2	2.4	2.3	71
Swim/Ski	0.0	0.0	0.0	0
Linefish	66.7	7.1	7.1	213
Dive/Spear	0.0	0.0	0.0	0
Other	11.1	1.2	1.2	36
Total	100.0	10.7	10.6	320

Activity	Percent	Avg. Trips Week day	Avg. Trips Weekend day	Monthly Total
Cruise	35.4	8.0	387.1	4988
Swim/Ski	6.3	15.3	68.5	685
Linefish	35.0	167.7	509.1	7764
Dive/Spear	1.3	3.3	13.5	180
Other	2.0	5.8	19.8	296
Total	100.0	278.1	998.0	14103

Activity	Percent	Avg. Trips Week day	Avg. Trips Weekend day	Monthly Total
Cruise	0.0	0.0	0.0	0
Swim/Ski	0.0	0.0	0.0	0
Linefish	100.0	8.1	26.3	389
Dive/Spear	0.0	0.0	0.0	0
Other	0.0	0.0	0.0	0
Total	100.0	8.1	26.3	389

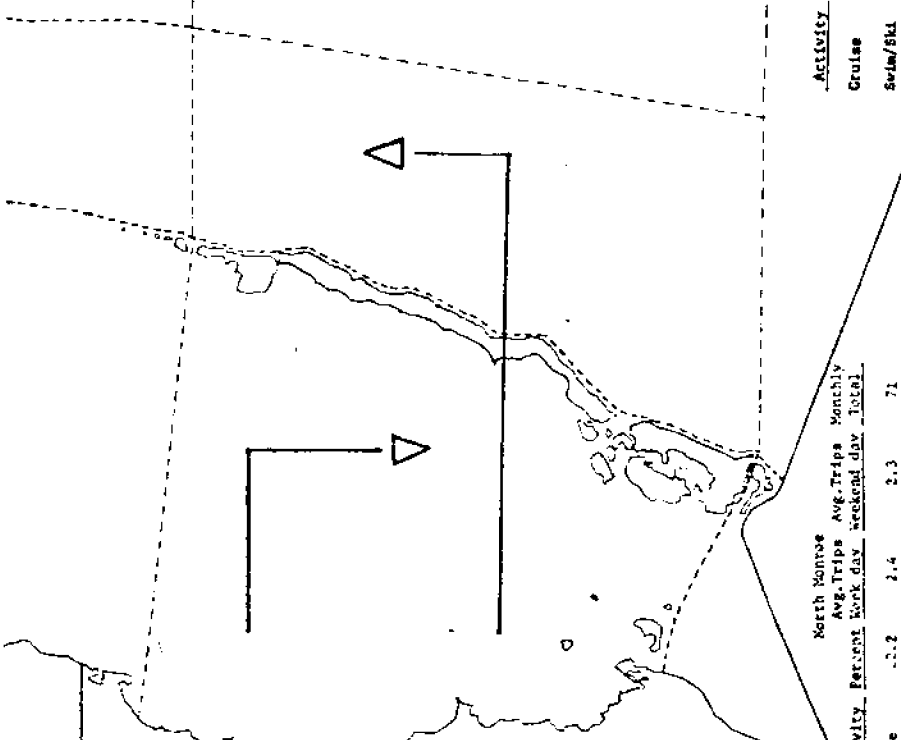
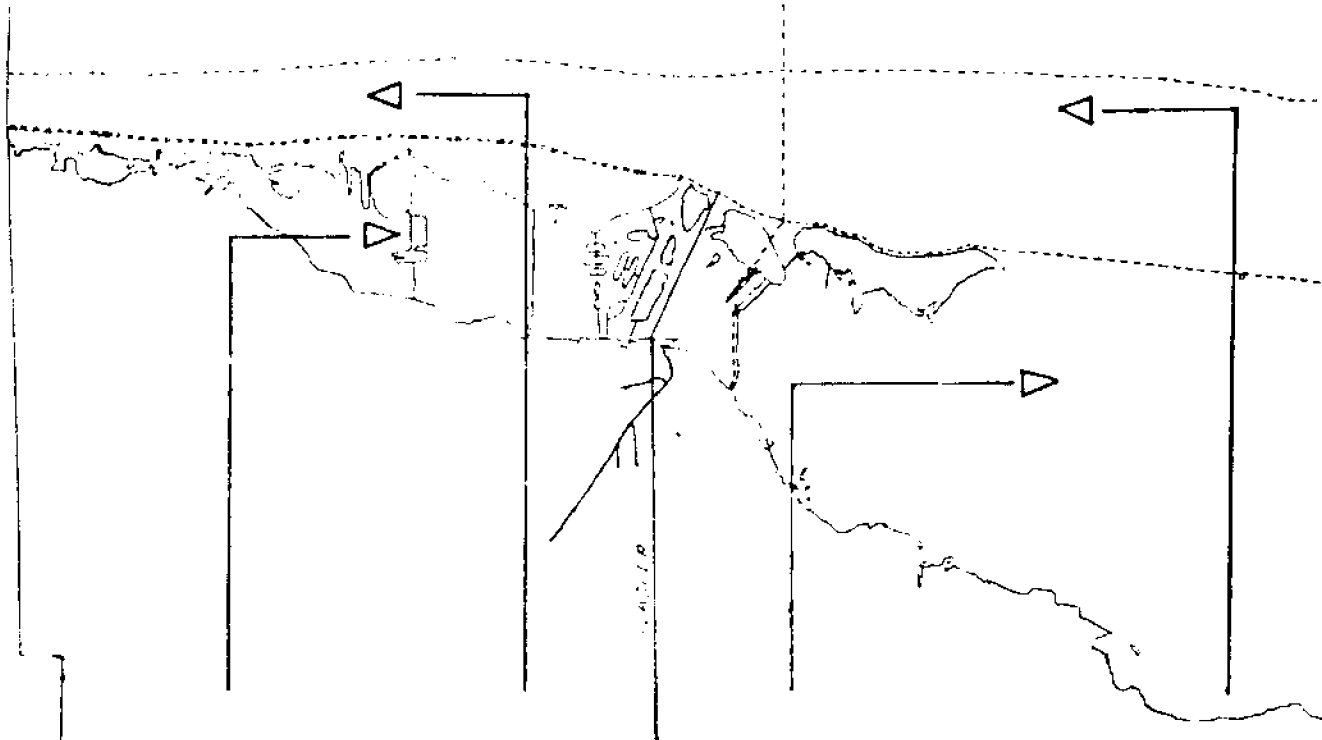


Figure 15. Winter trips, activities, and destinations in Dade County.



Activity	Percent	Avg. Trips Week Day	Avg. Trips Weekend Day	Monthly Total
Cruise	38.4	66.9	168.7	2417
Swim/Ski	12.3	16.6	41.9	700
Linefish	25.9	35.1	88.2	1478
Dive/Spear	7.1	3.4	8.5	160
Other	9.9	13.4	33.7	584
Total	100.0	135.4	340.3	5702

Activity	Percent	Avg. Trips Week Day	Avg. Trips Weekend Day	Monthly Total
Cruise	5.9	3.0	3.6	95
Swim/Ski	0.0	0.0	0.0	0
Linefish	88.2	45.1	53.8	1423
Dive/Spear	5.9	3.0	3.6	95
Other	0.0	0.0	0.0	0
Total	100.0	51.1	61.0	1623

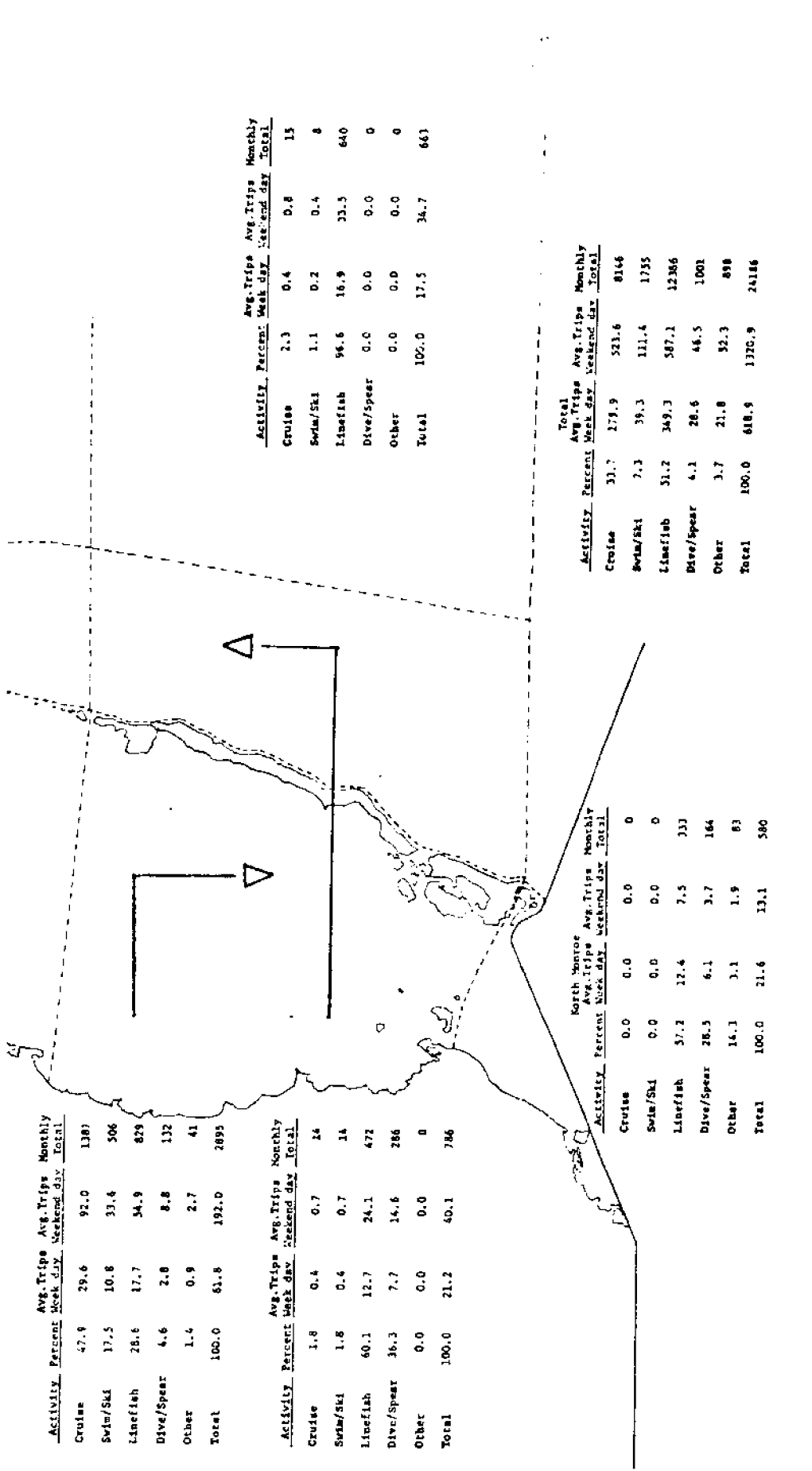
Activity	Percent	Avg. Trips Week Day	Avg. Trips Weekend Day	Monthly Total
Cruise	51.6	70.4	226.1	3534
Swim/Ski	7.1	9.3	32.9	468
Linefish	36.1	47.4	167.1	2380
Dive/Spear	0.3	0.4	1.4	20
Other	2.9	3.8	13.4	191
Total	100.0	131.3	462.9	6593

Activity	Percent	Avg. Trips Week Day	Avg. Trips Weekend Day	Monthly Total
Cruise	21.5	7.8	8.9	240
Swim/Ski	1.5	0.6	0.6	18
Linefish	61.3	22.3	25.4	694
Dive/Spear	14.2	5.2	5.8	162
Other	1.5	0.6	0.6	18
Total	100.0	36.5	41.4	1135

Activity	Percent	Avg. Trips Week Day	Avg. Trips Weekend Day	Monthly Total
Cruise	2.0	0.0	0.0	0
Swim/Ski	1.4	1.4	1.3	41
Linefish	98.4	84.4	77.9	2480
Dive/Spear	5.0	0.0	0.0	0
Other	0.0	0.0	0.0	0
Total	100.0	85.8	79.2	2521

Activity	Percent	Avg. Trips Week Day	Avg. Trips Weekend Day	Monthly Total
Cruise	2.4	1.4	1.3	41
Swim/Ski	2.0	0.0	0.0	0
Linefish	97.6	55.3	54.7	1654
Dive/Spear	2.0	0.0	0.0	0
Other	0.0	0.0	0.0	0
Total	100.0	56.7	56.0	1695

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Activity	Percent	Avg. Trips Week day	Avg. Trips Weekend day	Monthly Total
Cruise	47.9	29.6	92.0	1387
Swim/Ski	17.5	10.8	33.4	506
Linefish	28.6	17.7	34.9	829
Dive/Spear	4.6	2.8	8.8	132
Other	1.4	0.9	2.7	41
Total	100.0	61.8	192.0	2895

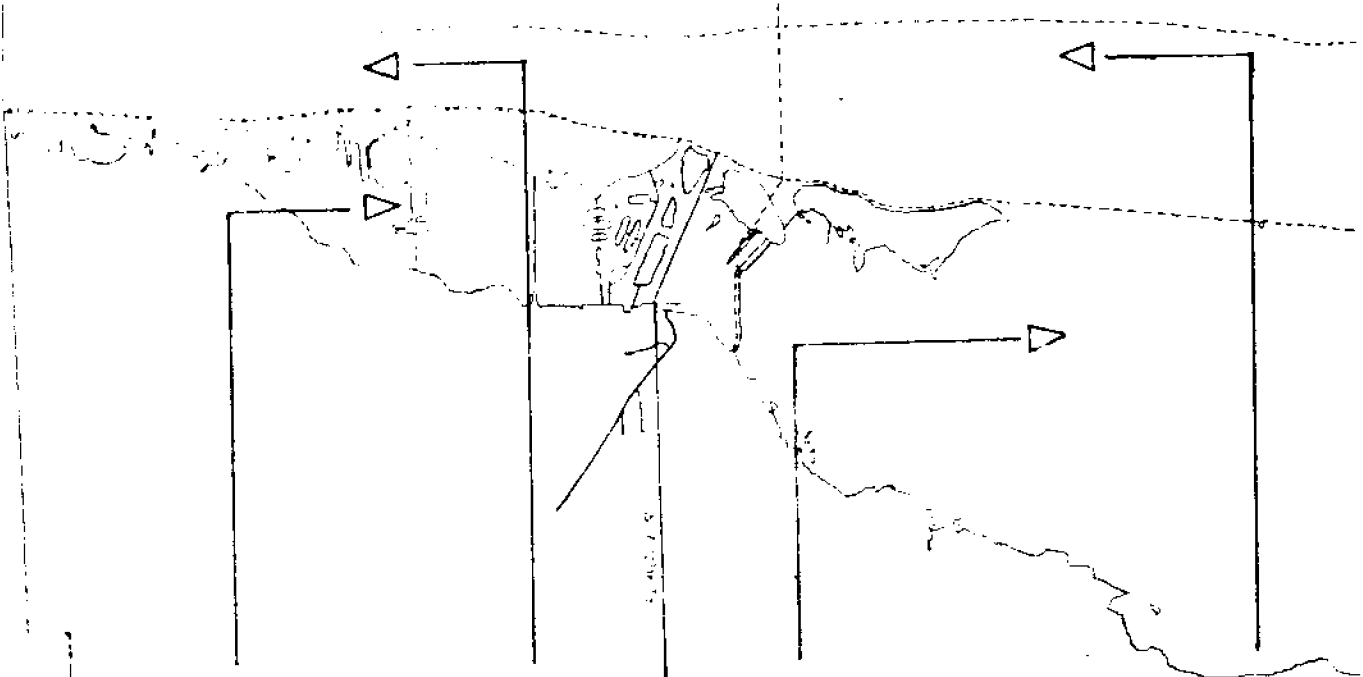
Activity	Percent	Avg. Trips Week day	Avg. Trips Weekend day	Monthly Total
Cruise	1.8	0.4	0.7	14
Swim/Ski	1.8	0.4	0.7	14
Linefish	40.1	12.7	24.1	472
Dive/Spear	36.3	7.7	14.6	286
Other	0.0	0.0	0.0	0
Total	100.0	21.2	40.1	786

North Monroe		Avg. Trips Week day		Avg. Trips Weekend day		Monthly Total	
Activity	Percent	Avg. Trips Week day	Avg. Trips Weekend day	Monthly Total	Activity	Percent	Monthly Total
Cruise	0.0	0.0	0.0	0	Cruise	33.7	173.9
Swim/Ski	0.0	0.0	0.0	0	Swim/Ski	7.3	39.3
Linefish	57.2	17.4	7.5	333	Linefish	51.2	349.3
Dive/Spear	28.5	6.1	3.7	164	Dive/Spear	4.1	26.6
Other	14.1	3.1	1.9	83	Other	3.7	21.8
Total	100.0	21.6	13.1	580	Total	100.0	618.9

Total		Avg. Trips Week day		Avg. Trips Weekend day		Monthly Total	
Activity	Percent	Avg. Trips Week day	Avg. Trips Weekend day	Monthly Total	Activity	Percent	Monthly Total
Cruise	33.7	173.9	523.6	8146	Cruise	2.3	0.4
Swim/Ski	7.3	39.3	111.4	1755	Swim/Ski	1.1	0.2
Linefish	51.2	349.3	587.1	12386	Linefish	96.6	16.9
Dive/Spear	4.1	26.6	44.5	1001	Dive/Spear	0.0	0.0
Other	3.7	21.8	52.3	898	Other	0.0	0.0
Total	100.0	618.9	1320.9	24186	Total	100.0	17.5

Total		Avg. Trips Week day		Avg. Trips Weekend day		Monthly Total	
Activity	Percent	Avg. Trips Week day	Avg. Trips Weekend day	Monthly Total	Activity	Percent	Monthly Total
Cruise	2.3	0.4	0.8	13	Cruise	2.3	0.4
Swim/Ski	1.1	0.2	0.4	8	Swim/Ski	1.1	0.2
Linefish	96.6	16.9	33.5	640	Linefish	96.6	16.9
Dive/Spear	0.0	0.0	0.0	0	Dive/Spear	0.0	0.0
Other	0.0	0.0	0.0	0	Other	0.0	0.0
Total	100.0	17.5	34.7	661	Total	100.0	17.5

Figure 16. Spring trips, activities, and destinations in Dade County.



Activity	Percent	Avg. Trips Week day	Avg. Trips Weekend day	Monthly Total
Cruise	8.6	7.5	195.2	131
Swim/Ski	26.3	2.5	113.0	149
Linefish	15.3	31.8	82.3	136
Dive/Spear	5.5	1.4	3.4	56
Other	4.4	10.6	27.4	452
Total	100.0	185.1	427.5	7052

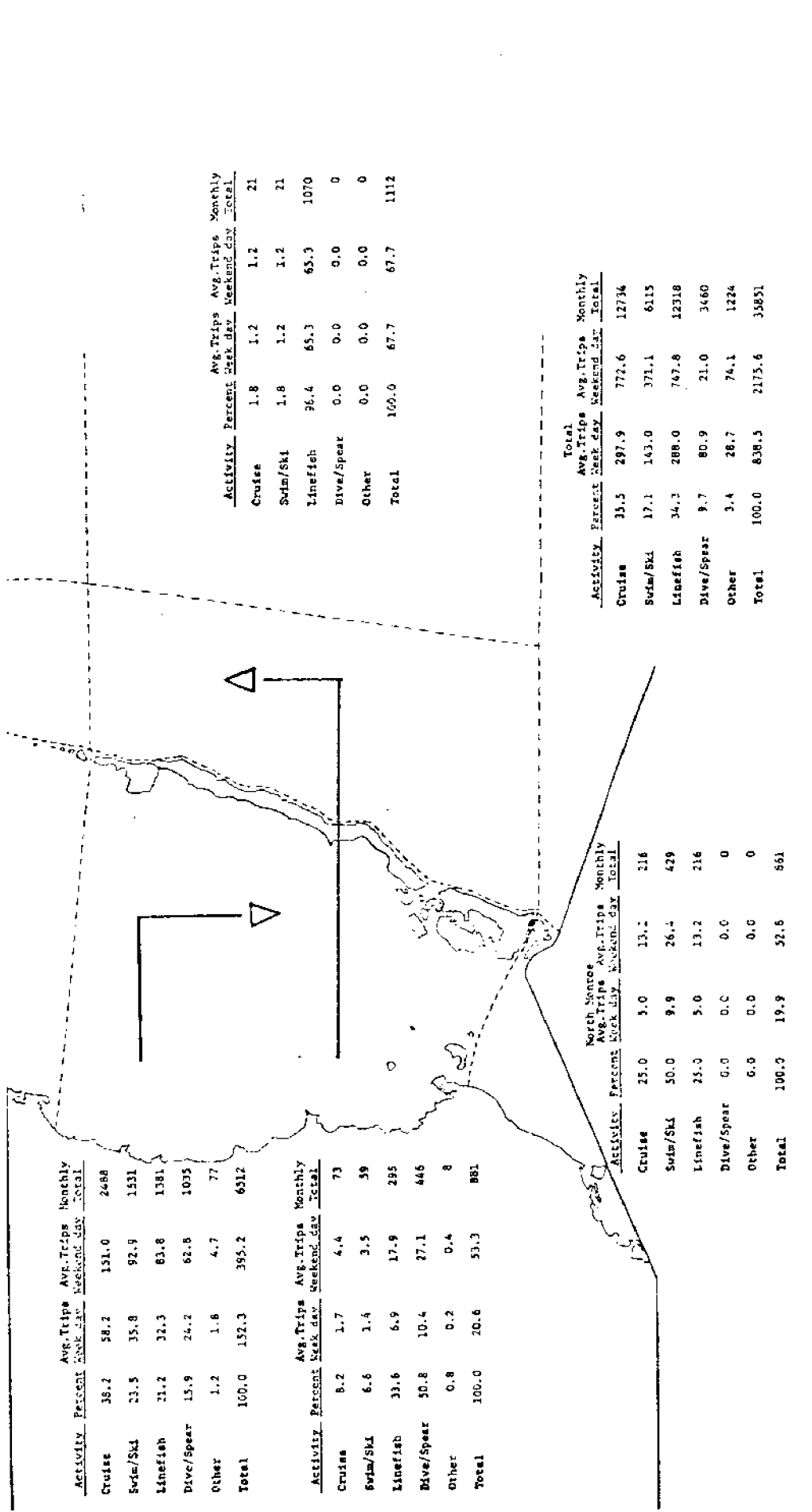
Activity	Percent	Avg. Trips Week day	Avg. Trips Weekend day	Monthly Total
Cruise	7.5	3.0	7.8	128
Swim/Ski	6.3	2.5	6.6	108
Linefish	87.5	27.2	70.4	1182
Dive/Spear	16.7	6.5	16.9	278
Other	2.5	1.0	2.6	43
Total	100.0	40.2	104.3	1719

Activity	Percent	Avg. Trips Week day	Avg. Trips Weekend day	Monthly Total
Cruise	33.8	140.8	365.1	6018
Swim/Ski	17.8	46.6	120.8	1992
Linefish	14.4	37.7	97.7	1611
Dive/Spear	8.4	21.9	57.0	938
Other	5.6	14.7	38.0	627
Total	100.0	261.7	678.6	11286

Activity	Percent	Avg. Trips Week day	Avg. Trips Weekend day	Monthly Total
Cruise	12.0	5.4	14.0	231
Swim/Ski	0.9	0.4	1.0	17
Linefish	49.5	22.2	57.7	950
Dive/Spear	16.7	16.5	42.8	705
Other	0.9	0.4	1.0	17
Total	100.0	44.8	116.5	1920

Activity	Percent	Avg. Trips Week day	Avg. Trips Weekend day	Monthly Total
Cruise	1.9	1.7	4.5	73
Swim/Ski	6.6	0.4	0.9	16
Linefish	95.3	43.1	109.5	1802
Dive/Spear	0.0	0.0	0.0	0
Other	0.0	0.0	0.0	0
Total	100.0	44.2	114.9	1891

Activity	Percent	Avg. Trips Week day	Avg. Trips Weekend day	Monthly Total
Cruise	7.4	4.7	12.2	201
Swim/Ski	1.7	1.1	2.8	47
Linefish	90.9	57.9	149.8	2472
Dive/Spear	0.0	0.0	0.0	0
Other	0.0	0.0	0.0	0
Total	100.0	63.7	164.8	2720



Activity	Percent	Avg. Trips Week day	Avg. Trips Weekend day	Monthly Total
Cruise	38.2	58.2	151.0	2488
Swim/Ski	23.5	35.8	92.9	1531
Linefish	21.2	32.3	83.8	1381
Dive/Spear	15.9	24.2	62.8	1035
Other	1.2	1.8	4.7	77
Total	100.0	152.3	395.2	6512

Activity	Percent	Avg. Trips Week day	Avg. Trips Weekend day	Monthly Total
Cruise	8.2	1.7	4.4	73
Swim/Ski	6.6	1.4	3.5	59
Linefish	33.6	6.9	17.9	295
Dive/Spear	50.8	10.4	27.1	446
Other	0.8	0.2	0.4	8
Total	100.0	20.6	53.3	881

Activity	Percent	Avg. Trips Week day	Avg. Trips Weekend day	Monthly Total
Cruise	25.0	3.0	13.2	216
Swim/Ski	50.0	9.9	26.4	429
Linefish	25.0	3.0	13.2	216
Dive/Spear	0.0	0.0	0.0	0
Other	0.0	0.0	0.0	0
Total	100.0	19.9	52.6	861

Activity	Percent	Avg. Trips Week day	Avg. Trips Weekend day	Monthly Total
Cruise	1.8	1.2	1.2	21
Swim/Ski	1.8	1.2	1.2	21
Linefish	96.4	65.3	65.3	1070
Dive/Spear	0.0	0.0	0.0	0
Other	0.0	0.0	0.0	0
Total	100.0	67.7	67.7	1112

Activity	Percent	Avg. Trips Week day	Avg. Trips Weekend day	Monthly Total
Cruise	31.5	297.9	772.6	12734
Swim/Ski	17.1	143.0	371.1	6115
Linefish	34.3	288.0	747.8	12318
Dive/Spear	9.7	80.9	21.0	3460
Other	3.4	28.7	74.1	1224
Total	100.0	838.5	2175.6	35851

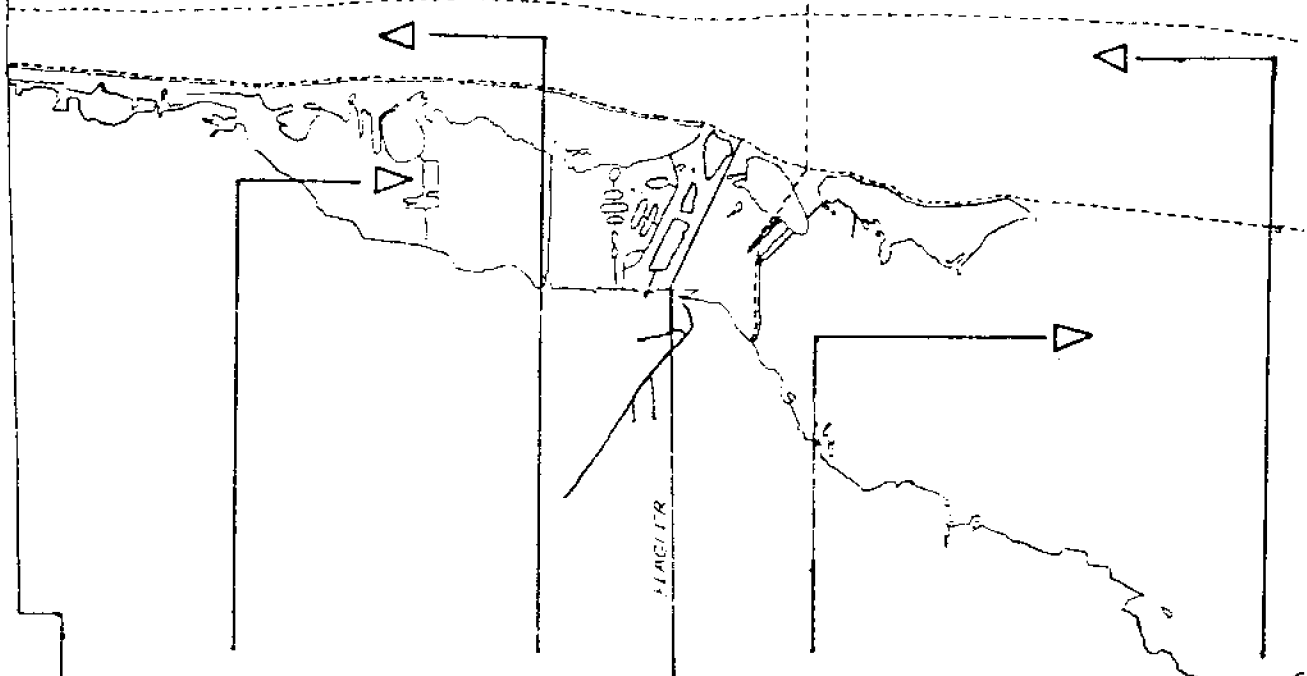
Figure 17. Summer trips, activities, and destinations in Dade County.

Activity	Percent	Avg. Trips Week day	Avg. Trips Weekend day	Monthly Total
Cruise	49.4	27.6	87.0	1303
Swim/Ski	12.3	6.9	21.7	325
Linefish	25.9	14.4	45.6	682
Dive/Spear	2.5	1.4	4.4	66
Other	9.9	5.5	17.4	260
Total	100.0	55.8	176.1	2636

Activity	Percent	Avg. Trips Week day	Avg. Trips Weekend day	Monthly Total
Cruise	5.9	1.0	3.1	47
Swim/Ski	0.0	0.0	0.0	0
Linefish	88.2	14.5	48.7	693
Dive/Spear	5.9	1.0	3.1	47
Other	0.0	0.0	0.0	0
Total	100.0	16.5	52.9	787

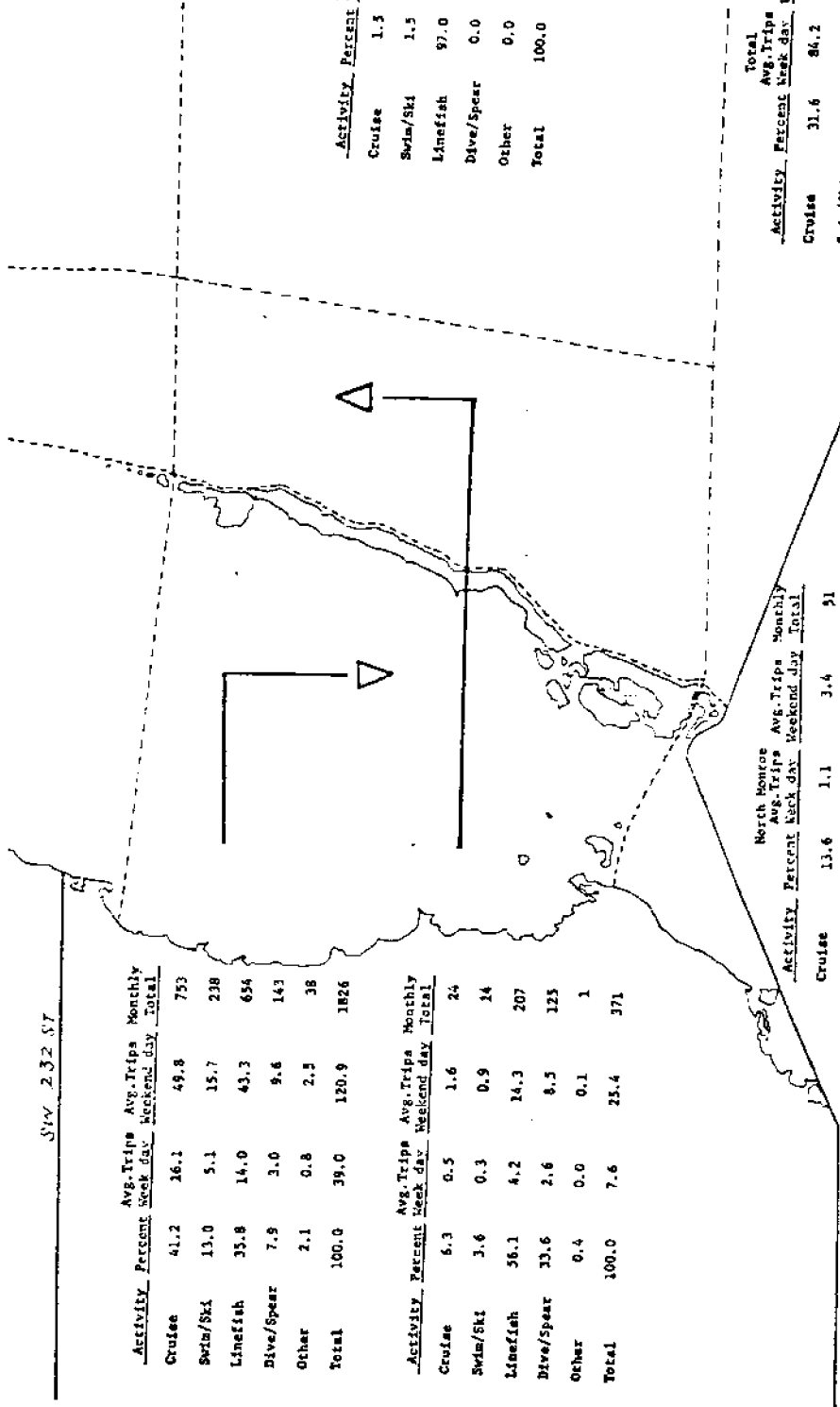
Activity	Percent	Avg. Trips Week day	Avg. Trips Weekend day	Monthly Total
Cruise	48.2	34.6	107.6	1622
Swim/Ski	7.6	5.5	17.0	257
Linefish	38.1	27.4	85.1	1284
Dive/Spear	2.9	2.1	6.5	98
Other	3.2	2.3	7.1	107
Total	100.0	72.9	223.3	3368

Activity	Percent	Avg. Trips Week day	Avg. Trips Weekend day	Monthly Total
Cruise	12.9	1.8	5.9	87
Swim/Ski	0.4	0.1	0.2	4
Linefish	63.8	9.2	29.1	435
Dive/Spear	22.5	3.2	10.3	153
Other	0.4	0.1	0.2	4
Total	100.0	15.4	45.8	683



Activity	Percent	Avg. Trips Week day	Avg. Trips Weekend day	Monthly Total
Cruise	0.0	0.0	0.0	0
Swim/Ski	1.6	0.4	1.2	18
Linefish	98.4	22.9	74.9	1103
Dive/Spear	0.0	0.0	0.0	0
Other	0.0	0.0	0.0	0
Total	100.0	23.3	76.1	1121

Activity	Percent	Avg. Trips Week day	Avg. Trips Weekend day	Monthly Total
Cruise	6.5	1.4	4.4	66
Swim/Ski	0.9	0.2	0.6	9
Linefish	92.6	19.6	62.1	928
Dive/Spear	0.0	0.0	0.0	0
Other	0.0	0.0	0.0	0
Total	100.0	21.2	67.1	1003



Activity	Percent	Avg. Trips Week day	Avg. Trips Weekend day	Monthly Total
Cruise	41.2	16.1	49.8	753
Swim/Ski	13.0	5.1	15.7	238
Linefish	35.8	14.0	43.3	654
Dive/Spear	7.9	3.0	9.6	143
Other	2.1	0.8	2.5	38
Total	100.0	39.0	120.9	1826

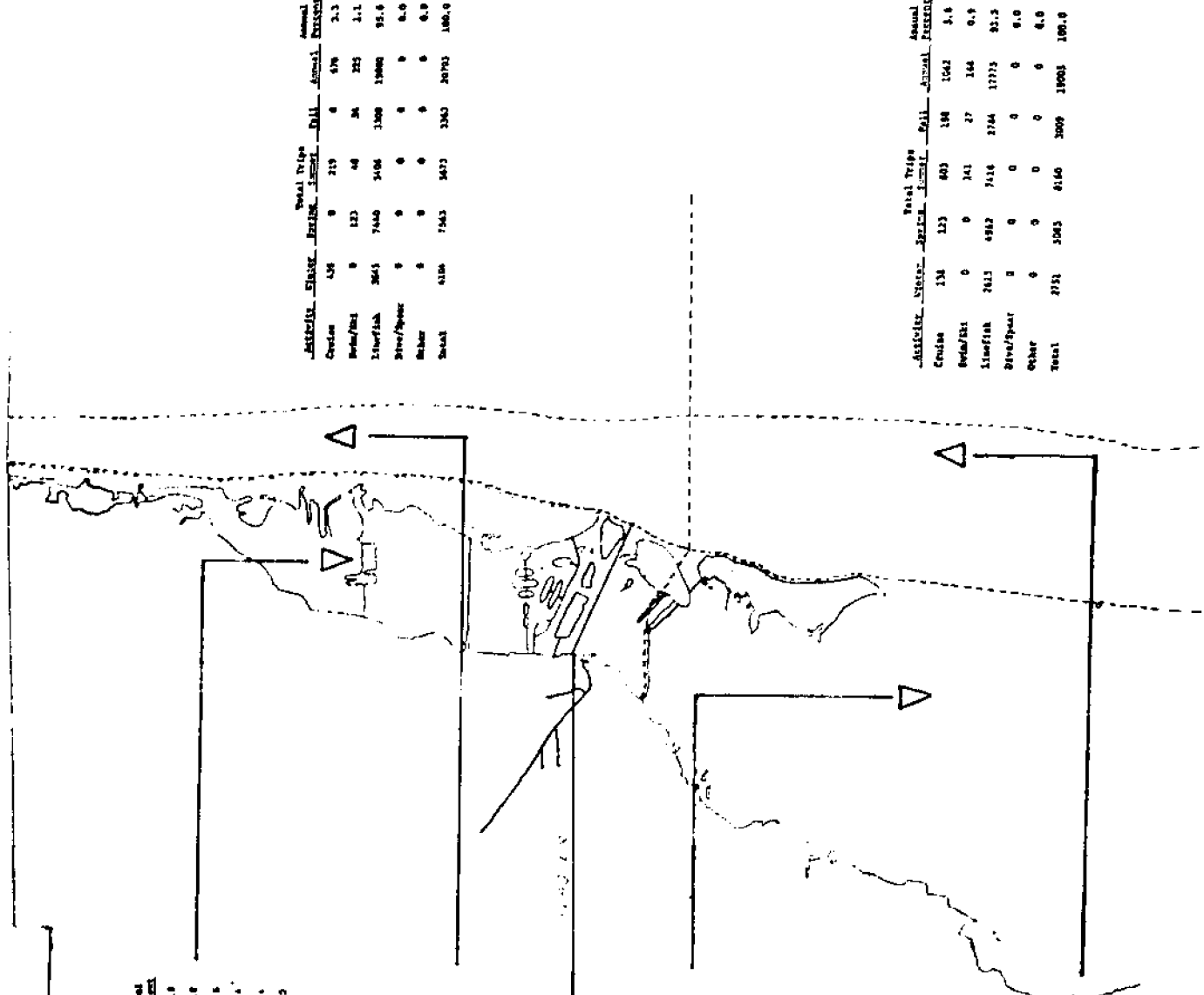
Activity	Percent	Avg. Trips Week day	Avg. Trips Weekend day	Monthly Total
Cruise	6.3	0.5	1.6	24
Swim/Ski	3.6	0.3	0.9	14
Linefish	56.1	4.2	14.3	207
Dive/Spear	33.6	2.6	8.5	123
Other	0.4	0.0	0.1	1
Total	100.0	7.6	25.4	371

North Housess				
Activity	Percent	Avg. Trips Week day	Avg. Trips Weekend day	Monthly Total
Cruise	13.6	1.1	3.4	51
Swim/Ski	13.6	1.1	3.4	51
Linefish	63.7	5.0	16.1	239
Dive/Spear	0.0	0.0	0.0	0
Other	9.2	0.7	2.3	34
Total	100.0	7.9	25.2	375

Total				
Activity	Percent	Avg. Trips Week day	Avg. Trips Weekend day	Monthly Total
Cruise	31.6	84.2	263.2	3958
Swim/Ski	7.4	19.7	61.1	921
Linefish	52.5	138.5	440.2	6569
Dive/Spear	5.0	13.3	42.4	632
Other	3.5	9.4	29.6	444
Total	100.0	265.1	836.5	12324

Activity	Percent	Avg. Trips Week day	Avg. Trips Weekend day	Monthly Total
Cruise	1.5	0.1	0.4	5
Swim/Ski	1.5	0.1	0.4	5
Linefish	97.0	7.3	23.0	345
Dive/Spear	0.0	0.0	0.0	0
Other	0.0	0.0	0.0	0
Total	100.0	7.5	23.8	355

Figure 18. Fall trips, activities, and destinations in Dade County.



ACTIVITY	Total Trips				Annual Percent
	Winter	Spring	Summer	Fall	
Cruise	1175	631	515	300	27.1
Boat/Fish	1771	2100	2497	973	107.9
Lifefish	2253	6426	4290	2004	225.5
Boat/Spec	8	429	174	190	3.1
Other	26	1452	1126	790	41.2
Total	5773	17186	21126	7900	100.0

ACTIVITY	Total Trips				Annual Percent
	Winter	Spring	Summer	Fall	
Cruise	172	215	244	141	4.1
Boat/Fish	0	0	325	0	2.1
Lifefish	2174	4255	3435	1578	51.8
Boat/Spec	0	185	874	143	8.3
Other	172	0	129	0	1.7
Total	2318	4655	5182	2161	100.0

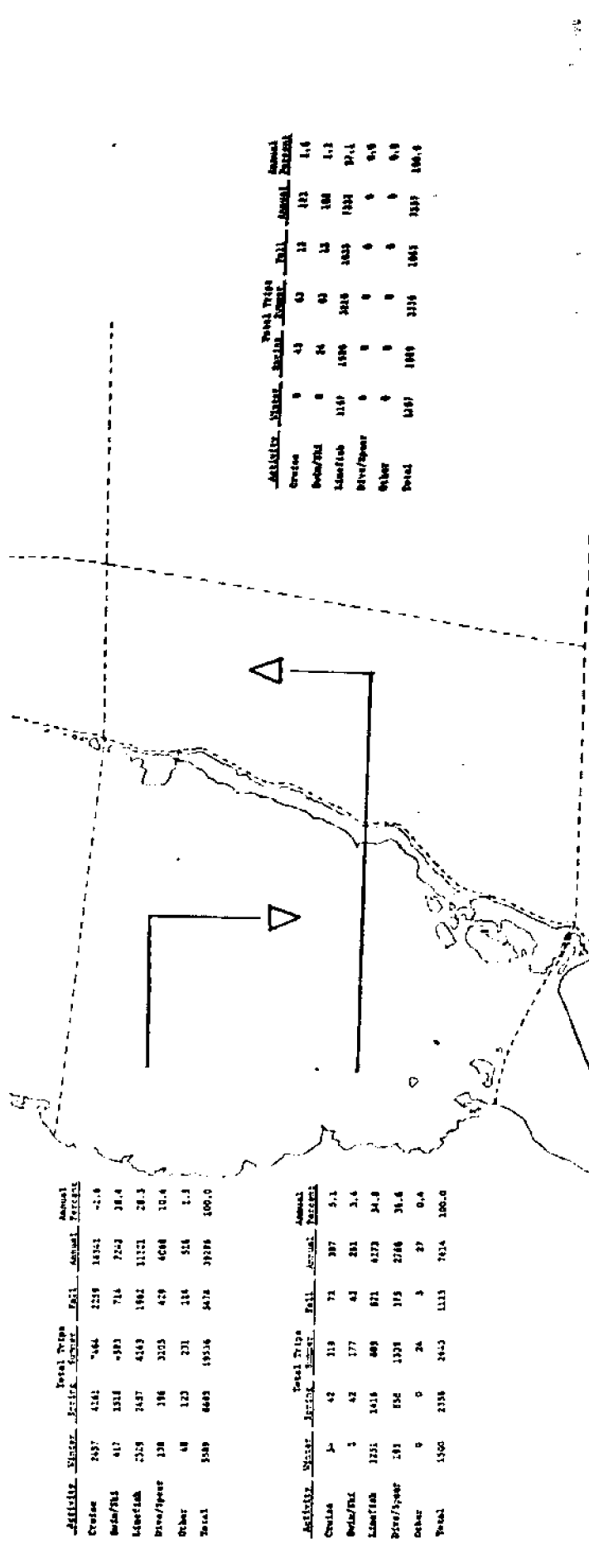
ACTIVITY	Total Trips				Annual Percent
	Winter	Spring	Summer	Fall	
Cruise	524	1562	1625	498	31.7
Boat/Fish	45	1406	3178	771	31.9
Lifefish	307	2400	4813	3532	28.6
Boat/Spec	99	60	2114	185	4.3
Other	286	373	1481	221	4.1
Total	1245	3971	10331	5926	100.0

ACTIVITY	Total Trips				Annual Percent
	Winter	Spring	Summer	Fall	
Cruise	171	729	893	241	14.9
Boat/Fish	0	54	31	12	0.9
Lifefish	939	2022	2450	1305	37.7
Boat/Spec	10	416	2213	429	15.6
Other	0	54	31	12	0.9
Total	1114	3465	5987	2001	100.0

ACTIVITY	Total Trips				Annual Percent
	Winter	Spring	Summer	Fall	
Cruise	438	0	219	0	2.3
Boat/Fish	0	123	48	26	1.1
Lifefish	2653	7460	2106	1200	95.6
Boat/Spec	0	0	0	0	0.0
Other	0	0	0	0	0.0
Total	3191	7583	2373	1226	100.0

ACTIVITY	Total Trips				Annual Percent
	Winter	Spring	Summer	Fall	
Cruise	134	123	493	188	3.4
Boat/Fish	0	0	141	27	0.9
Lifefish	2613	4942	2416	2784	85.3
Boat/Spec	0	0	0	0	0.0
Other	0	0	0	0	0.0
Total	2747	5065	2616	2909	100.0

10-2-78



Activity	Total Trips			Annual Mileage
	Winter	Spring	Fall	
Crashes	2437	4141	5464	18152
Police/PAI	417	1311	983	714
Identification	2325	3437	4143	1862
Police/Spur	138	306	3203	429
Other	48	123	231	315
Total	3389	6408	14056	30276

Activity	Total Trips			Annual Mileage
	Winter	Spring	Fall	
Crashes	3	42	119	73
Police/PAI	3	42	177	43
Identification	1255	1416	469	671
Police/Spur	281	156	1328	315
Other	0	0	24	3
Total	1540	2358	2443	1333

Activity	Total Trips			Annual Mileage
	Winter	Spring	Fall	
Crashes	213	0	148	133
Police/PAI	0	0	177	33
Identification	638	899	646	717
Police/Spur	6	482	0	0
Other	158	248	0	162
Total	860	1749	2113	1135

Activity	Total Trips			Annual Mileage
	Winter	Spring	Fall	
Crashes	1694	2410	3132	11074
Police/PAI	213	510	1823	2763
Identification	3282	3738	3814	16167
Police/Spur	340	1009	10380	1896
Other	880	1486	2871	1923
Total	42309	73350	107333	32921

Activity	Total Trips			Annual Mileage
	Winter	Spring	Fall	
Crashes	0	43	63	23
Police/PAI	0	24	63	33
Identification	1149	1896	2410	1038
Police/Spur	0	0	0	0
Other	0	0	0	0
Total	1149	1940	2473	1063

Figure 19. Total annual trips, activities, and destinations in Dade County.

County Marina Trips by Activities and Destinations

The types of activities in which boaters participate influence the amount of fuel they purchase, the amount and type of supplies they purchase, and the time of day they use the ramp facilities. The mix of activities varies from marina to marina.

The two main activities reported by users of all County marinas were line fishing and cruising (Table 31). At Haulover, Crandon, and Homestead, line fishing was the most important activity in all seasons. At North Bay and Matheson, cruising was the major activity in spring. Diving and spearfishing were reported most frequently at Homestead. Surface contact sports were reported heavily at Matheson in spring, and at Haulover and North Bay in summer.

Choice of offshore destinations is strongly influenced by activity, proximity of area to departure site, and weather conditions (Table 32). In terms of matching offshore destination with marina departure site, the north to south distinctions are most meaningful. A line fisherman departing from Matheson, for example, would be most likely to choose to fish in the middle bay, middle reef, or middle stream. At each marina, the boater is within a short reach of the bay, reef, and Gulf Stream.

TABLE 31
WEEKEND OFFSHORE ACTIVITY MIX BY PERCENT OF TRIPS
FROM COUNTY MARINAS BY SEASON

Destination	<u>Winter</u>				
	Cruise/ Land	Water Contact	Dive/ Spearfish	Line Fish	Other
Crandon	20.5	4.6	3.6	69.1	2.2
Matheson	43.0	2.1	1.2	52.9	0.8
Homestead	31.0	5.3	4.4	57.8	1.5
	<u>Spring</u>				
Haulover	16.5	7.3	1.8	71.6	2.8
North Bay	48.0	4.1	2.7	38.4	6.8
Crandon	26.1	2.9	2.9	63.5	4.6
Matheson	42.4	29.3	2.3	23.9	2.1
Homestead	26.4	8.8	10.6	52.8	1.4
	<u>Summer</u>				
Haulover	28.8	15.6	6.4	46.1	3.1
North Bay	34.5	15.3	6.0	39.5	4.7
Crandon	29.5	7.2	13.7	33.8	15.8
Matheson	23.7	8.9	10.0	39.9	17.5
Homestead	19.4	10.1	15.6	42.1	12.8

SOURCE: Estimated from marine site interviews.

TABLE 32

OFFSHORE DESTINATIONS BY PERCENT OF TOTAL TRIPS FROM COUNTY MARINAS

Destination	<u>Winter</u>		
	Crandon	Matheson	Homestead
Two or more areas	9.0	3.3	7.1
North Bay	7.1	1.4	0.0
North Reef	6.6	0.0	0.0
North Stream	2.2	0.2	0.0
Middle Bay	46.4	60.1	0.9
Middle Reef	17.8	11.3	0.0
Middle Stream	5.7	18.5	0.3
South Bay	3.0	4.7	64.0
South Reef	1.6	0.4	22.7
South Stream	0.6	0.0	2.7
Card Sound	0.0	0.0	0.3
N. Monroe Reef	0.0	0.2	2.1
N. Monroe Stream	0.0	0.0	0.0

Destination	<u>Spring</u>				
	Haulover	North Bay	Crandon	Matheson	Homestead
Two or more areas	21.1	11.0	4.6	22.1	9.7
North Bay	26.6	69.9	2.2	0.0	0.0
North Reef	4.6	9.6	1.2	0.0	0.0
North Stream	46.8	2.7	0.7	1.8	0.0
Middle Bay	0.0	4.1	46.1	43.6	0.7
Middle Reef	0.0	1.4	16.1	4.2	0.2
Middle Stream	0.9	0.0	26.1	19.0	0.9
South Bay	0.0	0.0	2.4	8.1	50.0
South Reef	0.0	1.4	0.0	0.8	13.5
South Stream	0.0	0.0	0.5	0.5	21.4
Card Sound	0.0	0.0	0.0	0.0	0.5
N. Monroe Reef	0.0	0.0	0.0	0.0	1.6
N. Monroe Stream	0.0	0.0	0.0	0.0	1.6

Destination	<u>Summer</u>				
	Haulover	North Bay	Crandon	Matheson	Homestead
Two or more areas	15.9	14.5	8.6	12.4	11.5
North Bay	36.6	54.0	1.7	0.3	0.0
North Reef	12.3	12.3	1.0	0.0	0.0
North Stream	34.4	6.4	0.3	0.3	0.0
Middle Bay	0.6	3.8	29.5	35.4	0.4
Middle Reef	0.3	3.8	28.4	15.8	0.0
Middle Stream	0.0	0.9	21.6	22.0	0.2
South Bay	0.0	3.4	3.8	8.9	42.5
South Reef	0.0	0.9	4.1	4.1	30.0
South Stream	0.0	0.0	0.0	0.7	12.8
Card Sound	0.0	0.0	0.3	0.0	1.3
N. Monroe Reef	0.0	0.0	0.7	0.0	0.7
N. Monroe Stream	0.0	0.0	0.0	0.0	0.7

SOURCE: Estimated from marina site interviews.

FISHING BY RECREATIONAL BOATERS

Line Fishing

Although line fishing is the most popular boating activity, its relative importance varies significantly with offshore areas and seasons (Figures 15-19). In the Gulf Stream, fishing is the major activity during all seasons of the year. In the reef areas, fishing is the major activity except in the south reef area during the summer, when dive/spearfishing is engaged in by a greater number of people. Fishing is the major activity in middle and south bay during the winter, but in the spring it takes second place to cruising. In summer, fishing ranks third in all three bay areas, behind cruising and water contact.

There are eighteen species or species groups listed by anglers as first or second preferences sought (Table 33). Five of these are of major importance during one or more seasons. Over the three seasons fishing was surveyed (winter, spring, summer), dolphin were the most sought after species in Dade County. Approximately 25.9 percent of the anglers reported dolphin as their first or second preference. A slightly smaller percentage (24.4) responded "anything" when asked for species sought. These are primarily bottom fishermen who could expect to catch a wide variety of species. Next in importance were snappers (14.4 percent), kingfish (9.3 percent), groupers (8.7 percent), and Spanish mackerel (4.1 percent).

TABLE 33

SPECIES PREFERENCE OF DADE COUNTY BOATING ANGLERS BY SEASON, 1976

Species	Winter (%)	Spring (%)	Summer (%)
Dolphin	5.8	37.1	5.6
Snappers	17.0	10.8	15.7
Kingfish	12.8	8.4	6.6
Groupers	11.4	4.7	10.2
Spanish mackerel	11.4	0.4	0.0
Billfish	2.1	3.9	3.9
Trout	1.5	3.6	1.8
Grunts	3.1	0.8	1.3
Bonefish	1.9	1.0	0.8
Barracuda	2.6	1.6	1.6
Snook	0.3	0.5	0.2
Tarpon	0.3	0.1	0.4
Bluefish	0.9	0.5	0.0
Jack	0.4	0.3	0.0
Pompano	1.8	0.0	0.0
Shark	0.1	0.6	0.2
Sand perch	0.1	0.1	0.0
Hogfish	0.2	0.0	0.0
Anything	26.1	25.1	21.8

SOURCE: Estimated from site interviews.

Species preference of anglers changes with season. This appears to be primarily in response to changes in the availability of certain fish stocks, particularly dolphin, kingfish, and Spanish mackerel. The top four species sought in winter were snappers, kingfish, Spanish mackerel and groupers. By spring, most of the kingfish and all of the Spanish mackerel have departed and dolphin are the most abundant and most sought large fish. The top four in spring are dolphin, snappers, kingfish and groupers. This pattern was maintained in summer with the exception that groupers are more sought than kingfish. Sea trout were expected to be a major species sought in the spring, but poor catches seemed to limit the incidence of fishermen seeking trout.

A preference for "groups" of species was detected. For example, snappers and groupers are often paired as first and second preference. Other preference groups are: bonefish-pompano, dolphin-kingfish-billfish, and Spanish mackerel-bluefish. Species in a preference group are usually those caught in the same area with similar methods. Many fishermen pursue only one preference group.

Estimates of total catch are made for the five major species or species groups caught by boating anglers (Table 34). Total catch estimates are made for winter, spring, and summer for grunts, snappers, groupers, dolphin and Spanish mackerel during the season in which they are abundant, spring and summer for dolphin and winter for Spanish mackerel. No estimates are made of fall catches due to lack of data. Winter catch estimates are less reliable than those of spring and summer because of limited aerial boat census.

All catch estimates exclude night fishing. Limited night sampling in March indicated little night fishing at that time. During the spring

TABLE 34

TOTAL CATCH OF THE MAJOR SPECIES AND SPECIES GROUPS CAUGHT BY ANGLERS IN DADE COUNTY
DURING WINTER, SPRING, AND SUMMER, 1976.

Species or Species Group	AREA												Total	
	North Bay	North Reef	North Stream	Middle Bay	Middle Reef	Middle Stream	South Bay	South Reef	South Stream					
GRUNTS														
winter	16,053	9,684	0	21,882	8,373	0	6,027	5,652	0	67,671				
spring	19,685	19,632	0	30,042	10,732	0	10,430	8,997	0	99,518				
summer	31,036	30,855	0	51,954	13,571	0	23,511	6,202	0	157,129				
total	66,774	60,171	0	103,878	32,676	0	39,968	20,851	0	324,318				
SNAPPERS														
winter	3,429	1,785	0	12,162	1,752	0	11,685	3,579	0	39,392				
spring	4,269	8,822	0	18,167	7,200	0	4,712	2,347	0	45,517				
summer	12,170	6,813	0	14,509	9,362	0	10,577	6,879	0	60,310				
total	19,868	17,420	0	44,838	18,314	0	76,974	12,805	0	140,219				
DOLPHIN														
winter	0	0	22,201	0	0	19,188	0	0	4,635	46,024				
spring	0	0	6,000	0	0	12,537	0	0	10,908	29,445				
summer	0	0	28,201	0	0	31,725	0	0	15,543	75,469				
total														
GROUPERS														
winter	1,854	735	0	2,172	1,113	0	906	1,707	0	8,487				
spring	984	1,707	0	3,016	2,631	0	976	3,058	0	12,372				
summer	174	435	0	1,233	3,159	0	333	1,797	0	7,131				
total	3,012	2,877	0	6,421	6,903	0	2,215	6,562	0	27,990				

TABLE 34 CONTINUED

Species or Species Group	AREA								Total	
	North Bay	North Reef	North Stream	Middle Bay	Middle Reef	Middle Stream	South Bay	South Reef		South Stream
SPANISH MACKEREL										
winter	0	0	0	5,037	351	363	48	0	0	5,799
spring										
summer										
total	0	0	0	5,037	351	363	48	0	0	5,799

SOURCE: Estimated from site interview creel census.

and summer, night fishing may be significant for bottom fishes but research constraints prohibited night sampling. Therefore, total catches of snappers, grunts, and groupers are underestimated for the spring and summer. Tables 35-37 indicate species composition within species groups and mean fork lengths.

TABLE 35
SPECIES COMPOSITION OF THREE SPECIES GROUPS CAUGHT BY
DADE COUNTY ANGLERS IN SPRING AND SUMMER, 1976.

Species	Spring (%)	Summer (%)	Total (%)
SNAPPERS			
<u>Lutjanus griseus</u> (Mangrove Snapper)	64.4	41.4	51.4
<u>Lutjanus analis</u> (Mutton Snapper)	8.5	10.6	9.7
<u>Ocyurus chrysurus</u> (Yellowtail)	16.9	46.4	33.5
Other snappers	10.2	1.5	5.4
GROUPERS			
<u>Epinephelus morio</u> (Red Grouper)	63.1	63.3	63.2
<u>Epinephelus striatus</u> (Nassau Grouper)	8.9	12.2	10.0
<u>Mycteroperca bonaci</u> (Black Grouper)	26.2	4.1	18.6
Other groupers	1.8	20.4	8.2
GRUNTS			
<u>Haemulon plumieri</u> (White Grunt)	65.5	87.1	77.4
<u>Haemulon sciurus</u> (Bluestriped Grunt)	30.8	10.9	19.9
Other grunts	3.6	2.0	2.7

SOURCE: Estimated from site interview creel census.

Spearfishing

Approximately 58.8 percent of the spearfishermen use rubber-powered trigger activated guns, 16.5 percent use Hawaiian slings, and 24.7 percent use both. A small number use pneumatic or spring-powered guns or pole guns. Sixty percent are free diving (snorkel only), and 28.4 percent use SCUBA when spearfishing. The diving depth range of spearfishermen

(especially free diving) is limited (Table 38). Of all spearfishing in Dade County, no spearfishing was recorded deeper than 80 feet (although there probably is a small amount of activity in greater depths). and 71.5 percent was conducted between 11 and 30 feet. Nearly all free diving (94.7 percent) occurred in water less than 30 feet deep.

Species sought is limited: groupers (35.8 percent), hogfish (32.4 percent) and snappers (8.9 percent). Preference for snappers is misleading because many spearfishermen regard hogfish as a snapper.

The greatest number of spearfishing trips is made to middle reef, with most of the remainder going to south reef. Seasonally, winter through summer, these two areas combined contained 71.4, 63.4, and 63.5 percent of all spearfishing activity in the County. Some spearfishing trips are to north reef, middle bay in the vicinity of the Safety Valve, and south bay in the creeks between the keys, but effort is low in these areas. Although the data indicates considerable effort in north bay in spring, this is probably a sampling error.

Spearfishing (and diving) in Dade County is strongly influenced by temperature. Average trips per month in the winter are 106 compared to 570 in the spring and 1,323 in the summer. Except for the middle and south reef areas, spearfishing is a minor part of total boating activity (approximately 7 percent of all boating activity). In middle reef, from winter through summer, spearfishing is 5.7, 9.3, and 23.1 percent of total activity. In south reef, spearfishing is 10.4, 32.6, and 33.5 percent of total activity.

Total catches by spearfishermen for the two most important species groups (hogfish and grouper) were estimated in each offshore area by season (Table 39). Tables 40 and 41 indicate species composition of groupers and mean fork lengths of hogfish and groupers by species.

TABLE 36

MEAN FORK LENGTH OF 13 IMPORTANT SPECIES LANDED BY
DADE COUNTY ANGLERS IN SPRING AND SUMMER, 1976.

Scientific Name	Common Name	Sample Size	Mean Fork Length (cm)
<u>Lutjanus griseus</u>	Mangrove Snapper	277	23.7
<u>Lutjanus analis</u>	Mutton Snapper	44	45.6
<u>Ocyurus chrysurus</u>	Yellowtail Snapper	86	22.1
<u>Epinephelus morio</u>	Red Grouper	143	30.9
<u>Epinephelus striatus</u>	Nassau Grouper	7	31.4
<u>Mycteroperca bonaci</u>	Black Grouper	53	38.4
<u>Haemulon plumieri</u>	White Grunt	540	20.3
<u>Haemulon sciurus</u>	Bluestriped Grunt	207	21.0
<u>Sphyraena barracuda</u>	Great Barracuda	87	46.6
<u>Lachnolaimus maximus</u>	Hogfish	30	30.7
<u>Scomberomorus cavalle</u>	Kingfish	26	79.7
<u>Cynoscion nebulosus</u>	Spotted Sea Trout	37	35.5
<u>Coryphaena hippurus</u>	Dolphin	192	54.2

SOURCE: Estimated from site interview creel census.

TABLE 38

DEPTH DISTRIBUTION OF SPEARFISHERMEN BY DIVING GEAR

Depth (ft)	Free Diving	SCUBA	Both	Total
0 - 10	14.0	3.7	0.0	9.5
11 - 20	49.1	14.8	45.5	38.9
21 - 30	31.6	37.0	27.3	32.6
31 - 40	3.5	25.9	18.2	11.6
41 - 60	1.8	3.7	9.1	3.2
61 - 80	0.0	14.8	0.0	4.2
% of total	60.0	28.4	11.6	

SOURCE: Estimated from site interviews.

TABLE 37

MEAN FORK LENGTH BY AREAS OF SEVEN SPECIES LANDED BY BOATING ANGLERS
BY AREA FISHED DURING SPRING AND SUMMER, 1976.

Species	Common Name	BAY		REEF	
		Sample Size	Mean Fork Length(cm)	Sample Size	Mean Fork Length(cm)
<u>Lutjanus griseus</u>	Mangrove Snapper	205	22.5	78	26.4
<u>Lutjanus analis</u>	Mutton Snapper	8	31.1	24	46.5
<u>Ocyurus chrysurus</u>	Yellowtail Snapper	14	18.6	55	23.3
<u>Haemulon plumieri</u>	White Grunt	205	19.7	283	20.8
<u>Haemulon sciurus</u>	Bluestriped Grunt	144	21.1	47	21.1
<u>Epinephelus morio</u>	Red Grouper	18	26.4	107	31.5
<u>Mycteroperca bonaci</u>	Black Grouper	18	29.5	45	44.9

SOURCE: Estimated from site interview creel census.

TABLE 39

TOTAL CATCH OF HOGFISH AND GROUPERS BY SPEARFISHERMEN IN DADE COUNTY DURING
WINTER, SPRING AND SUMMER, 1976.

Species	AREA								Total	
	North Bay	North Reef	North Stream	Middle Bay	Middle Reef	Middle Stream	South Bay	South Reef		South Stream
HOGFISH										
winter					42			360		402
spring					211			2,167		2,378
summer		339		194	2,751			7,386		10,670
total		339		194	3,004			9,913		13,450
GROUPERS										
winter					24			76		100
spring					677		319	1,859		2,855
summer		242			1,239		171	2,310		3,962
total		242			1,940		490	4,245		6,917

SOURCE: Estimated from site interview creel census.

Comparison of Spear and Line Fishing

Spearfishing only competes with line fishing on the reefs. Significant overlapping of species sought and caught only occurs with groupers. Few line fishermen seek or catch hogfish. Groupers landed by spearfishermen have a larger mean fork length than those landed by line fishermen. However, total spearfishing activity and grouper catch is much less than that of line fishermen in all areas during all seasons except the south reef during the summer. For that area in the summer, there were as many spear as line fishing trips and the total catch by spearfishermen was greater than by line fishermen.

TABLE 40

SPECIES COMPOSITION OF GROUPERS TAKEN BY SPEARFISHERMEN IN
DADE COUNTY DURING SPRING AND SUMMER, 1976.

Species	Spring	Summer	Total
<u>Epinephelus morio</u> (Red Grouper)	43.9	68.0	57.3
<u>Epinephelus striatus</u> (Nassau Grouper)	31.7	20.0	25.2
<u>Mycteroperca bonaci</u> (Black Grouper)	22.0	8.0	14.2
Other groupers	2.4	4.0	3.3

SOURCE: Estimated from site interview creel census.

TABLE 41

MEAN FORK LENGTH OF FOUR IMPORTANT SPECIES TAKEN BY
SPEARFISHERMEN IN DADE COUNTY

Species	Common Name	Sample Size	Mean Fork Length
<u>Lachnolaimus maximus</u>	Hogfish	99	33.9
<u>Epinephelus morio</u>	Red Grouper	38	39.2
<u>Mycteroperca bonaci</u>	Black Grouper	11	57.2

SOURCE: Estimated from site interview creel census.

Because spearfishing is so strongly influenced by season (temperature) and depth, if the degree of competition for grouper stocks is measured in terms of catch, then spearfishing is not a significant competitor of line fishing in Dade County waters.

EXPENDITURES FOR BOATING

Trip Expenditures and Fuel Consumption in Dade County

Recreational boating has an important impact not only on natural resources but also on the economy of Dade County. As already noted, in the survey year 1975-1976 there were 259,992 recreational boat trips in Dade County. For most of these trips, fuel and trip supplies were consumed.

The amount of fuel consumed per trip and expenditures for trip supplies vary with boat size. Table 42 shows the variation in average fuel consumption and expenditures for trip supplies between boat length groups. Both fuel consumption and trip supply expenditures increase with boat length. Reported average fuel consumption and trip supply expenditures for boats utilizing County marinas are slightly lower than for all Dade boats.

By dividing total boating trips into length groups and using average fuel consumption and expenditures for trip supplies, total (all Dade) fuel consumption and trip supply expenditures by length boat were estimated (Table 43). It is estimated that 3,680,940 gallons of fuel and \$4,409,058 in trip supplies were purchased in the study year.

Value of Boats in Dade County

Table 44 is the reported value of boats at County marinas by length and year built. While there is no basis to assume that the distribution of boats by size and year built at County marinas is representative of all registered boats in Dade County, it is expected that these values are

representative for all boats in Dade County that are in these size and year categories. Table 45 indicates the value of the registered boats in Dade County based on the reported values in Table 44.

TABLE 42
AVERAGE PER TRIP FUEL CONSUMPTION AND EXPENDITURES
FOR TRIP SUPPLIES

Size Boat	Trip Supplies in Dollars (std. dev.)			Fuel Consumption in Gallons (std. dev.)	
	County Marinas ¹	All Dade ²		County Marinas ¹	All Dade ²
16	6.6 (4.5)	13.8 (21.4)	Power	6.9 (4.3)	7.4 (6.1)
			Sail	0.0 (0.0)	1.0 (1.4)
16-20	11.2 (7.1)	14.7 (10.3)	Power	11.9 (5.3)	12.7 (6.9)
			Sail	1.5 (1.8)	3.2 (3.8)
21-25	15.8 (13.0)	18.3 (15.9)	Power	16.8 (8.3)	18.6 (9.4)
			Sail	1.5 (1.3)	3.5 (6.1)
26-39	15.7 (11.4)	27.6 (21.1)	Power	34.7 (21.8)	40.1 (18.4)
			Sail	2.4 (2.6)	2.2 (2.2)
40 +	36.3 (31.3)	45.7 (30.0)	Power	75.0 (34.0)	49.0 (26.2)
			Sail	11.3 (15.6)	10.5 (13.4)

¹ Averaged over five County marinas from questionnaires dispersed with site interviews.

² Estimated from questionnaire mailed to registered boaters.

TABLE 43

MONTHLY FUEL CONSUMPTION AND EXPENDITURES FOR TRIP SUPPLIES
 BY SEASON BY BOAT LENGTH FOR ALL BOATING IN DADE COUNTY

Season	<u>Monthly Fuel Consumption</u>					Total Gallons
	< 16' Gallons	16'-20' Gallons	21'-25' Gallons	26'-39' Gallons	40'+ Gallons	
Winter	17,866	69,403	72,409	35,973	4,000	199,651
Spring	30,650	119,065	124,211	61,709	6,828	342,463
Summer	45,421	176,452	184,090	91,445	10,140	507,548
Fall	15,866	61,640	64,316	31,941	3,555	177,318
Annual	329,409	1,279,680	1,335,078	663,204	73,569	3,680,940

TABLE 43 CONTINUED

Monthly Trips and Expenditures for Trip Supplies

Season	Boat Length												Total	
	< 16'		16-20'		21'-25'		26'-39'		40'+		Total			
	Trips/ Mo.	Dollars	Trips/ Mo.	Dollars	Trips/ Mo.	Dollars	Trips/ Mo.	Dollars	Trips/ Mo.	Dollars	Trips/ Mo.	Dollars	Trips/ Mo.	Dollars
Winter	2,707	37,384	5,597	82,444	4,554	83,247	1,142	31,542	99	4,524	14,103	239,141		
Spring	4,644	64,134	9,602	141,437	7,812	142,803	1,959	54,108	169	7,723	24,186	410,205		
Summer	6,882	95,040	14,230	209,608	11,578	211,646	2,903	80,181	251	11,471	35,851	607,946		
Fall	2,404	33,199	4,971	73,223	4,045	73,943	1,014	28,007	88	4,022	12,524	212,394		
Annual	49,911	689,271	103,200	1,520,136	83,967	1,534,917	21,054	581,514	1,821	83,220	259,992	4,409,058		

SOURCE: Table 28 and Table 42.

TABLE 44

REPORTED VALUE OF BOATS BY LENGTH AND YEAR BUILT AT COUNTY MARINAS

Length	Year					
	66-70	71	72	73	74	75
1-15	1,243 (248)	1,190 (708)	1,200 (583)	1,250 (354)	1,950 (900)	1,500 (800)
16-20	2,405 (1,677)	2,503 (1,179)	3,280 (1,967)	3,657 (1,937)	5,017 (2,236)	5,300 (2,192)
21-25	5,938 (3,577)	5,527 (1,877)	6,670 (2,707)	5,773 (2,680)	8,308 (3,207)	11,981 (18,825)
26-39	20,548 (12,543)	20,400 (7,300)	27,173 (29,184)	27,214 (10,878)	31,987 (24,481)	26,000 (8,708)
40 & over *	153,438 (151,900)	88,467 (51,654)	97,562 (74,756)	65,500 (93,882)	158,625 (197,940)	107,500 (60,104)

SOURCE: Responses to written questionnaire dispersed at marinas.
 * Small sample size makes these averages unreliable.
 (std. dev.)

County Marina Trip Expenditures and Fuel Consumption

Tables 46 and 47 estimate fuel consumption and trip supply expenditures by boat length for trips originating from each of the five County marinas. It is estimated that 2,020,833 gallons of fuel were consumed during these trips (54.9 percent of all fuel consumed by recreational boats in Dade County) and that \$1,818,981 was spent on trip supplies (41.3 percent of all trip expenditures in Dade County).

Table 48 indicates the percentage of trip supplies and fuel purchased at the primary departure site.

TABLE 45
ESTIMATED VALUE (IN DOLLARS) OF DADE COUNTY RECREATIONAL BOATING
FLEET OF REGISTERED BOATS

Length	Before 71	1971	1972	1973	1974	1975	Total
1'-15'	7,909,209	834,190	1,100,400	1,320,000	1,971,450	409,500	13,544,749
16'-20'	22,796,995	3,196,331	4,700,240	6,279,069	6,687,661	2,989,200	46,649,496
21'-25'	18,093,086	3,095,120	5,436,050	5,663,313	6,388,852	5,487,298	44,163,719
26'-39'	28,417,884	3,855,600	6,032,406	7,238,924	7,037,140	2,990,000	55,571,954
40' and over*	41,428,260	2,565,543	3,609,794	2,947,500	5,551,875	967,500	57,070,472
Total Boats	118,645,434	13,546,784	20,878,890	23,448,806	27,636,978	12,843,498	217,000,390

SOURCE: Table 3 and Table 44. This does not include documented boats.

* Small sample size makes these estimates unreliable.

TABLE 46

MONTHLY FUEL CONSUMPTION (IN GALLONS) BY BOATS
UTILIZING COUNTY MARINAS BY SEASON AND BOAT LENGTH

Site	<u>Winter</u>				Total
	<16'	16'-20'	21'-25'	26' <	
Haulover	384	6,014	3,432	203	10,033
North Bay	592	4,937	1,903	122	7,554
Crandon	1,391	17,848	10,109	386*	
				7,826+	37,560
Matheson	917	14,726	10,390	934*	
Homestead	936	10,963	4,883	17,898+	44,865
				447*	
Total				7,652+	24,881
					124,893
Site	<u>Spring</u>				Total
	<16'	16'-20'	21'-25'	26' <	
Haulover	1,072	16,855	9,656	589	28,172
North Bay	1,326	10,963	4,243	284	16,816
Crandon	1,788	22,881	12,964	508*	
				10,464+	48,605
Matheson	1,027	16,504	11,669	1,035*	
Homestead	1,736	20,376	9,032	22,759+	52,994
				832*	
Total				16,285+	48,261
					194,848
Site	<u>Summer</u>				Total
	<16'	16'-20'	21'-25'	26' <	
Haulover	852	13,322	7,644	467	22,285
North Bay	1,183	9,898	3,822	264	15,167
Crandon	3,192	40,886	23,150	893*	
				12,753+	80,874
Matheson	1,540	24,829	17,534	1,563*	
Homestead	2,392	27,915	12,355	34,880+	80,346
				1,137*	
Total				12,164+	55,963
					254,635
Site	<u>Fall</u>				Total
	<16'	16'-20'	21'-25'	26' <	
Haulover	267	4,126	2,356	142	6,891
North Bay	475	3,933	1,529	102	6,039
Crandon	949	12,185	6,895	264*	
				7,063+	27,356
Matheson	767	12,366	8,736	771*	
Homestead	442	5,179	2,309	18,748+	41,388
				203*	
Total				6,104+	14,237
					95,911
Total Annual Fuel Consumption in Gallons					2,010,861

SOURCE: Responses to written questionnaires dispersed at marinas.

* Fuel consumption by trailerable boats 26' <.

+ Fuel consumption by berthed boats 26' <.

TABLE 47

MONTHLY EXPENDITURES FOR SUPPLIES (DOLLARS) BY BOATERS
UTILIZING COUNTY MARINAS BY SEASON AND BOAT LENGTH

<u>Winter</u>									
Site	< 16'		16'-20'		21'-25'		26' <		Total
	Trips	\$'s	Trips	\$'s	Trips	\$'s	Trips	\$'s	
Haulover	59	392	497	5,576	220	3,474	10	157	9,599
North Bay	91	605	408	4,578	122	1,926	6	94	7,203
Crandon	214	1,423	1,475	16,550	648	10,232	19*	298*	
							359	6,128+	34,631
Matheson	141	938	1,217	12,655	666	10,516	46*	723*	
							821	14,014+	39,846
Homestead	144	958	906	10,165	313	4,942	22*	346*	
							351	5,992+	22,403
Total									113,682
<u>Spring</u>									
Haulover	165	1,097	1,393	15,629	619	9,774	29	456	26,956
North Bay	204	1,357	906	10,165	272	4,295	14	220	16,037
Crandon	275	1,829	1,891	21,217	831	13,121	25*	393*	
							480	8,194+	44,754
Matheson	158	1,051	1,364	15,304	748	11,811	51*	801*	
							1,044	17,821+	46,788
Homestead	267	1,775	1,684	18,894	579	9,142	41*	644*	
							747	12,751+	43,206
Total									177,741
<u>Summer</u>									
Haulover	131	871	1,101	12,353	490	7,737	23	361	21,320
North Bay	182	1,210	818	9,178	245	3,869	13	204	14,461
Crandon	491	3,265	3,379	37,912	1,484	23,432	44*	691*	
							585	9,986+	75,286
Matheson	212	1,410	1,833	20,566	1,006	15,885	69*	1,084*	
							1,967	33,577+	72,522
Homestead	368	2,447	2,307	25,885	792	12,506	56*	880*	
							558	9,525+	51,243
Total									234,832
<u>Fall</u>									
Haulover	41	273	341	3,826	151	2,384	7	110	6,593
North Bay	73	485	325	3,647	98	1,547	5	79	5,758
Crandon	146	971	1,007	11,299	442	6,979	3*	204*	
							324	5,531+	24,984
Matheson	118	785	1,022	11,467	560	8,842	38*	597*	
							860	14,680+	36,371
Homestead	68	452	428	4,802	148	2,337	10*	157*	
							280	4,780+	12,528
Total									86,234
Total Annual Expenditures for Supplies Other Than Fuel								1,837,461	

SOURCE: Responses to written questionnaires dispersed at marinas.

* Trips per month and expenditures by trailerable boats 26' < .

+ Trips per month and expenditures by berthed boats 26' < .

TABLE 48
 PERCENT OF SUPPLIES AND FUEL PURCHASED AT PRIMARY DEPARTURE SITE

Departure Site	Percent Trip Supplies	Percent Fuel
County Marinas ¹	7.9	6.3
Haulover	7.9	6.3
North Bay	0	0
Crandon	15.0	19.3
Matheson	12.5	24.0
Homestead	7.2	10.6
All Dade ²	14.7	34.0

SOURCE:

¹ Estimated from questionnaires dispersed with site interviews.

² Estimated from questionnaires mailed to registered boaters.

MARINA SITE PREFERENCE

Travel Time and Distance

Those who live greater distances from the coast must travel longer and further to their primary departure site (Table 49). The average travel time and distance by marina is recorded in Table 50.

Existing Site Preferences

Figure 20 indicates the percentage of boaters in each residence area going to each marina. The "other" category is primarily private yacht club type facilities. Figures 21-25 indicate the percentage of marina traffic from each residence area and percentage of traffic from each marina to each offshore destination area. Note that Figure 20 indicates, by residence area, the marina choice, while Figures 21-25 indicate by marina, the percent of traffic from each residence area.

TABLE 50
TRAVEL TIME AND DISTANCE TO COUNTY MARINAS

Marina	By respondents to site questionnaire	
	avg. time in minutes	avg. distance
Haulover	23.0 (9.0)	9.5 (6.3)
North Bay	21.5 (14.1)	7.9 (5.0)
Crandon	28.8 (15.1)	14.1 (10.3)
Matheson	19.6 (10.1)	8.8 (5.9)
Homestead	28.3 (13.6)	16.5 (11.2)

SOURCE: Estimated from questionnaires dispersed at marinas.

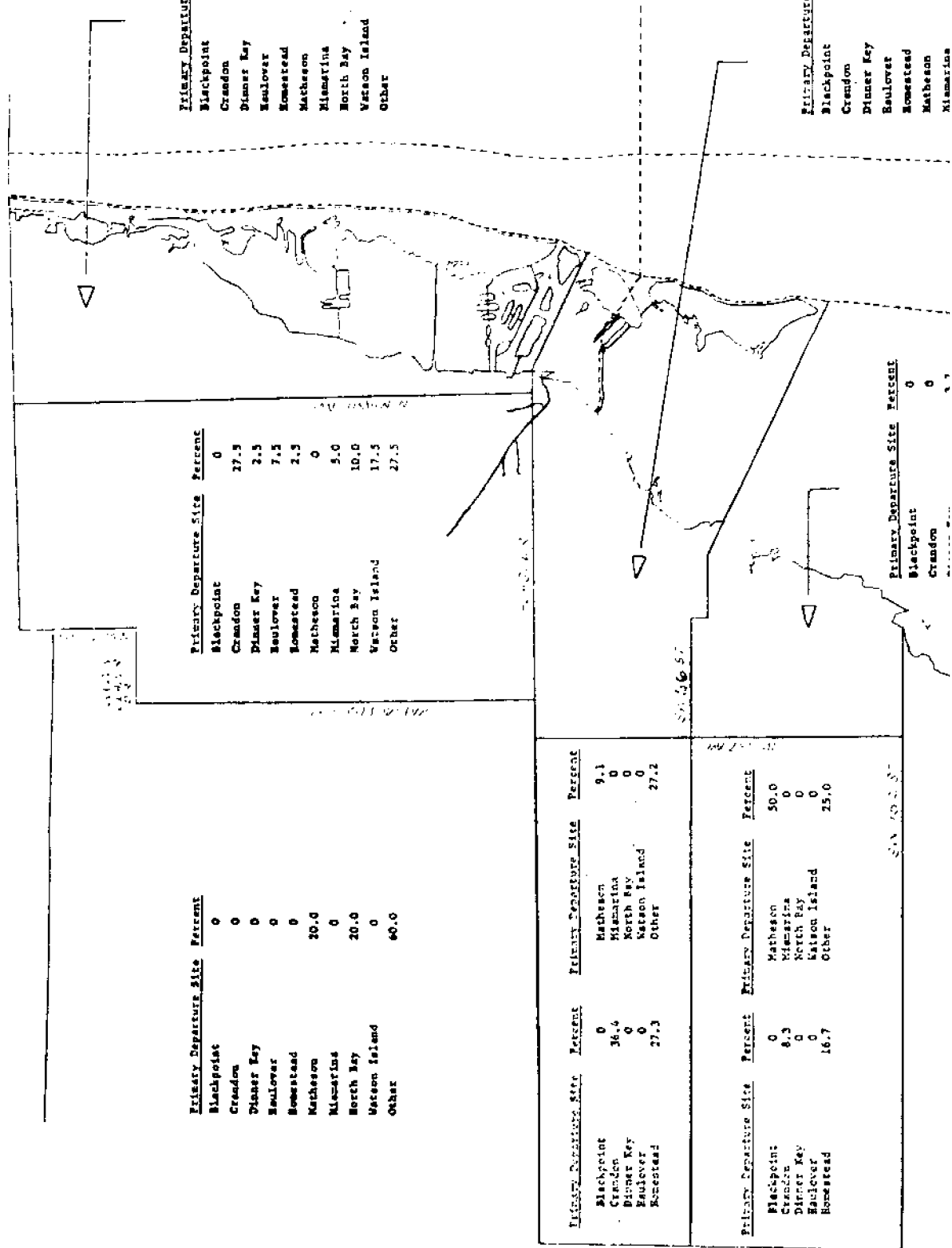
TABLE 49

TRAVEL TIME AND DISTANCE TO PRIMARY DEPARTURE SITE RESIDENCE AREA

Area ³	By respondents to ¹ site questionnaire		By respondents to ² mail questionnaire	
	avg. time (std. dev.)	avg. distance (std. dev.)	avg. time (std. dev.)	avg. distance (std. dev.)
Area 1	36.1 (14.5)	19.2 (12.4)	40.0 (23.5)	32.3 (26.2)
Area 2	31.1 (10.4)	15.9 (9.1)	30.4 (18.1)	16.2 (13.2)
Area 3	18.4 (12.3)	7.9 (8.1)	18.3 (16.9)	8.3 (13.4)
Area 4	23.4 (11.7)	11.2 (8.5)	44.2 (26.8)	28.3 (21.8)
Area 5	16.6 (12.3)	7.7 (9.3)	21.4 (22.7)	13.2 (23.9)
Area 6	23.4 (11.7)	11.2 (8.5)	29.4 (13.7)	14.6 (10.9)
Area 7	16.6 (12.3)	7.7 (9.3)	15.6 (10.6)	8.6 (14.1)
Area 8	23.6 (7.8)	12.6 (5.4)	25.8 (13.0)	13.9 (6.7)
Area 9	23.1 (10.1)	13.8 (12.3)	26.8 (12.1)	12.3 (8.0)

SOURCE:

- 1 Estimated from questionnaires dispersed at marinas.
- 2 Estimated from questionnaires mailed to registered boat owners.
- 3 See Figure 3 for locations.



Primary Departure Site	Percent
Blackpoint	0
Crandon	5.1
Dinner Key	0
Boulover	10.3
Komestead	2.6
Matheson	0
Miamarina	2.6
North Bay	12.8
Watson Island	10.3
Other	65.3

Primary Departure Site	Percent
Blackpoint	0
Crandon	27.5
Dinner Key	2.5
Boulover	7.5
Komestead	2.5
Matheson	0
Miamarina	5.0
North Bay	10.0
Watson Island	17.5
Other	27.5

Primary Departure Site	Percent
Blackpoint	0
Crandon	0
Dinner Key	0
Boulover	0
Komestead	0
Matheson	20.0
Miamarina	0
North Bay	20.0
Watson Island	0
Other	60.0

Primary Departure Site	Percent	Primary Departure Site	Percent
Blackpoint	0	Matheson	9.1
Crandon	36.4	Miamarina	0
Dinner Key	0	North Bay	0
Boulover	0	Watson Island	0
Komestead	27.3	Other	27.2

Primary Departure Site	Percent	Primary Departure Site	Percent
Blackpoint	0	Matheson	50.0
Crandon	8.3	Miamarina	0
Dinner Key	0	North Bay	0
Boulover	0	Watson Island	0
Komestead	16.7	Other	25.0

Primary Departure Site	Percent
Blackpoint	0
Crandon	20.0
Dinner Key	17.5
Boulover	0
Komestead	2.5
Matheson	15.0
Miamarina	5.0

Primary Departure Site	Percent
Blackpoint	0
Crandon	0

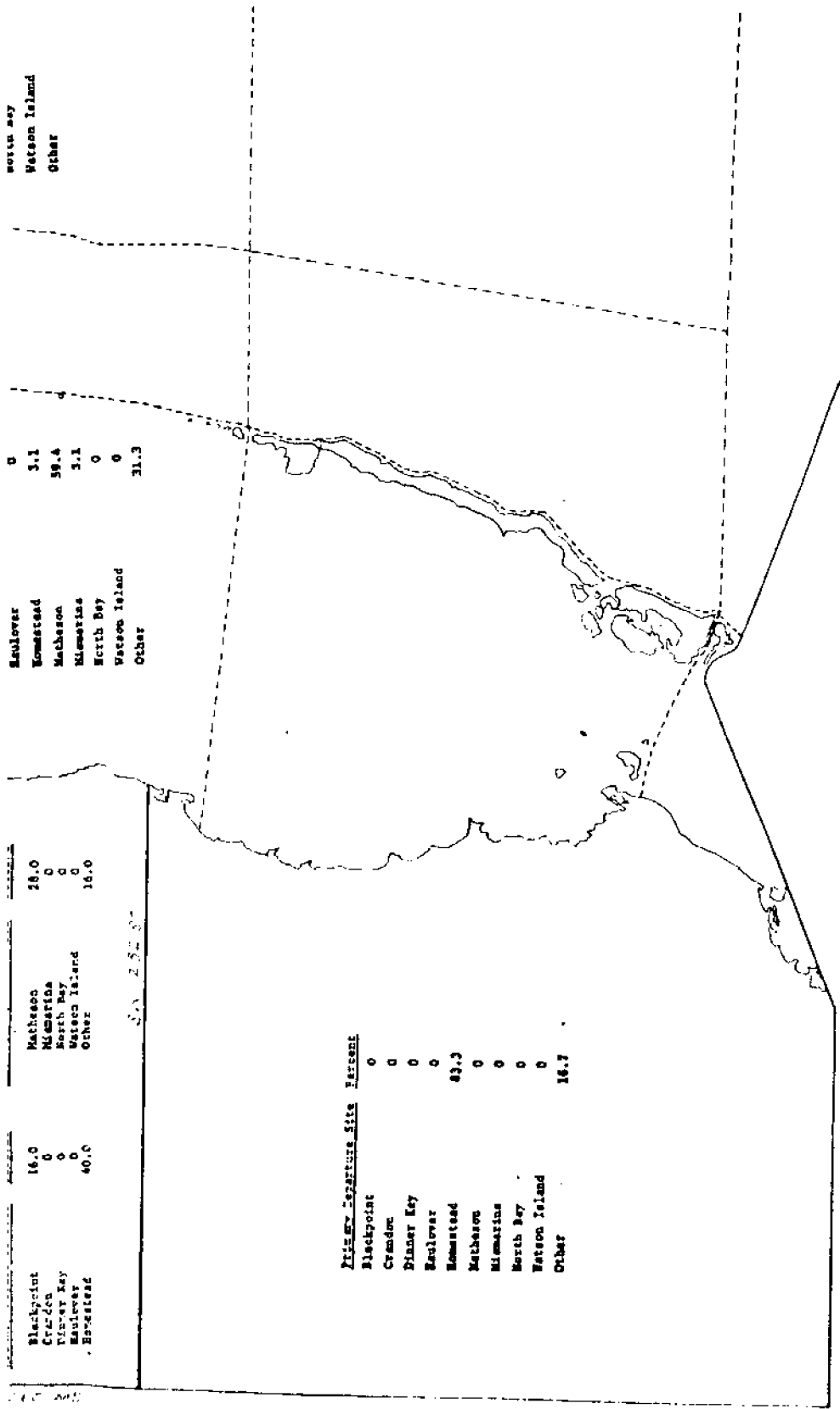


Figure 20. Primary marina site by residence area.

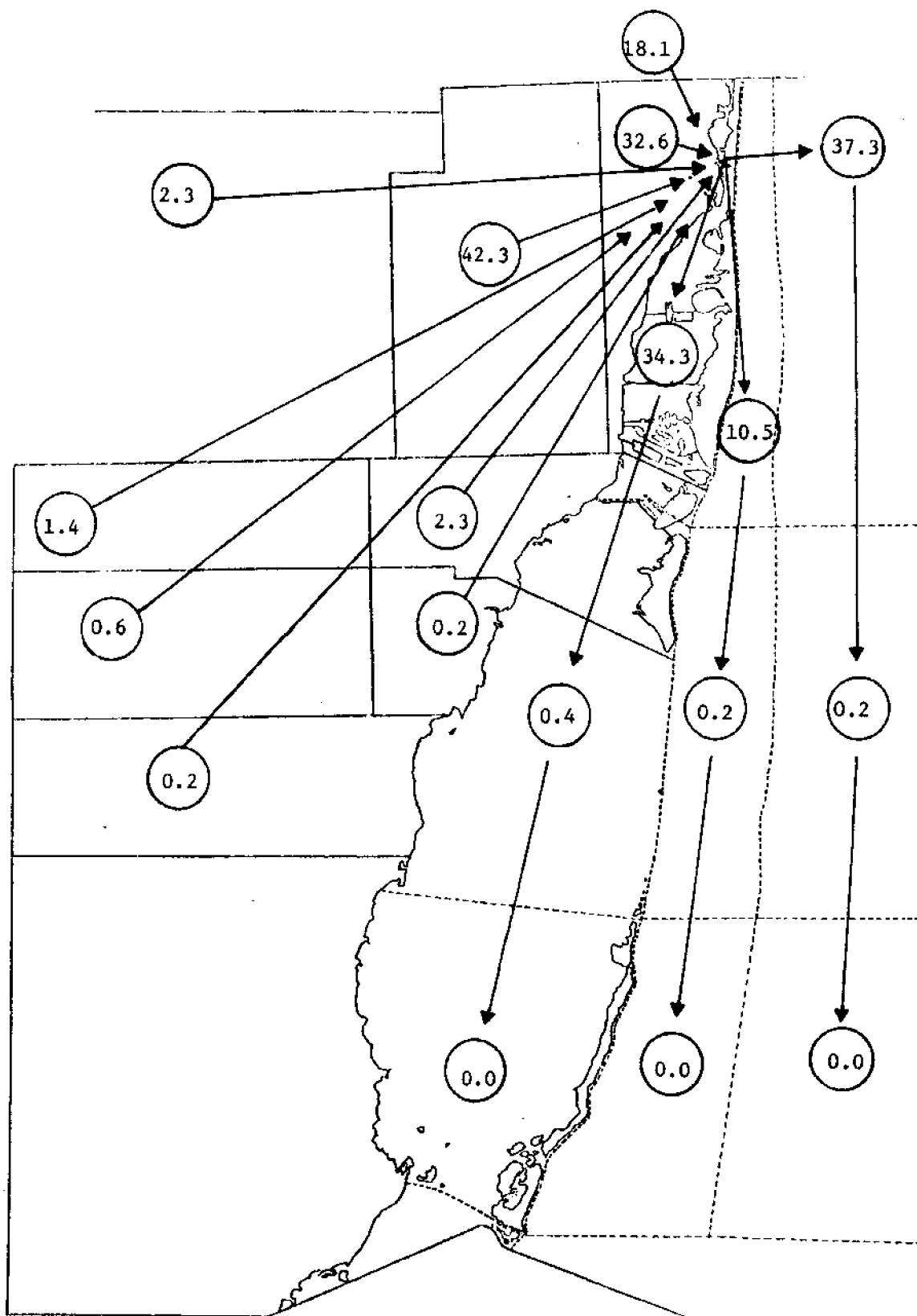


Figure 21. Haulover destination patterns: percent from each residence area and percent to each offshore destination area. (estimated from site interviews)

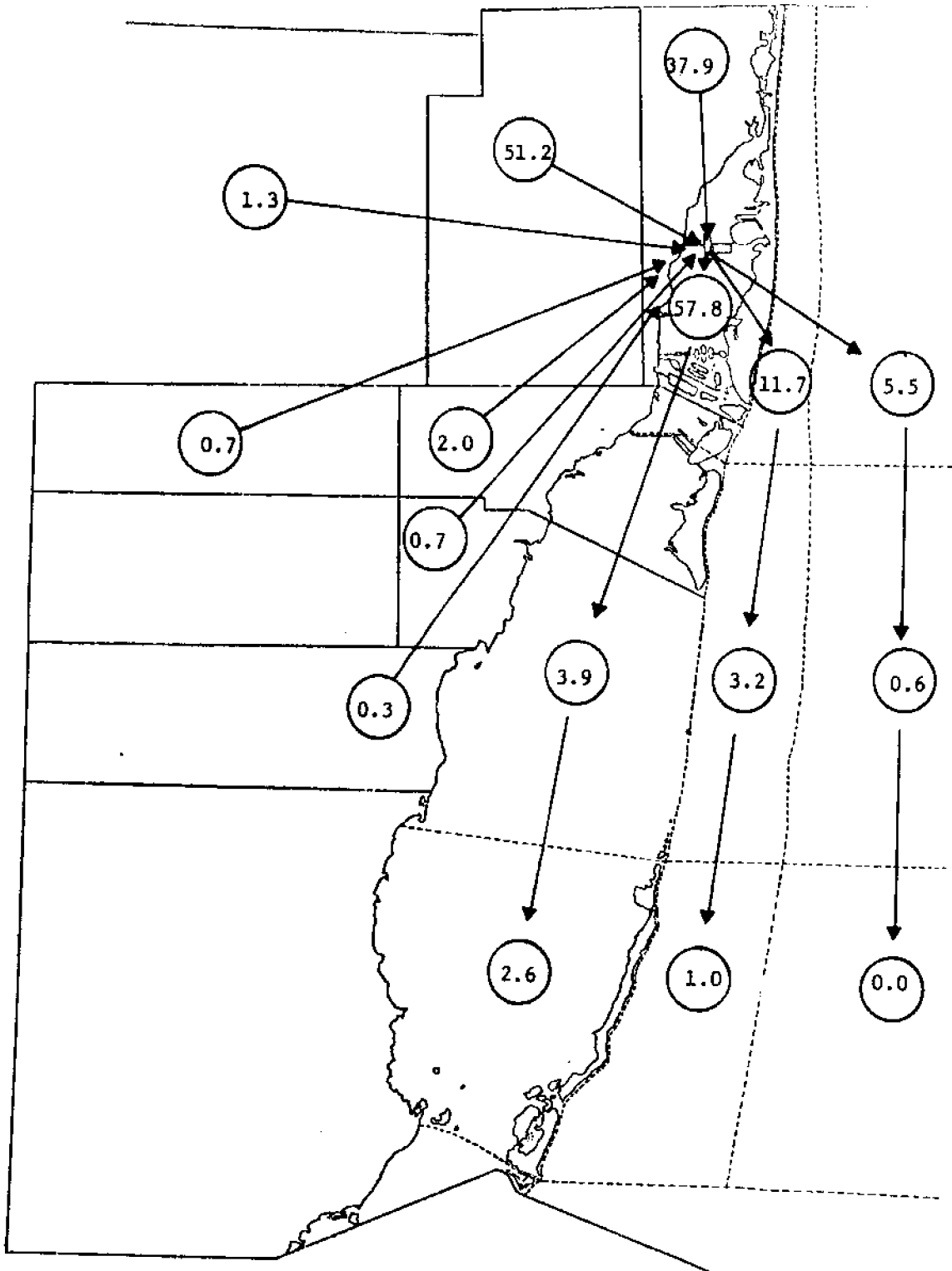


Figure 22. North Bay destination patterns: percent from each residence area and percent to each offshore destination area. (estimated from site interviews)

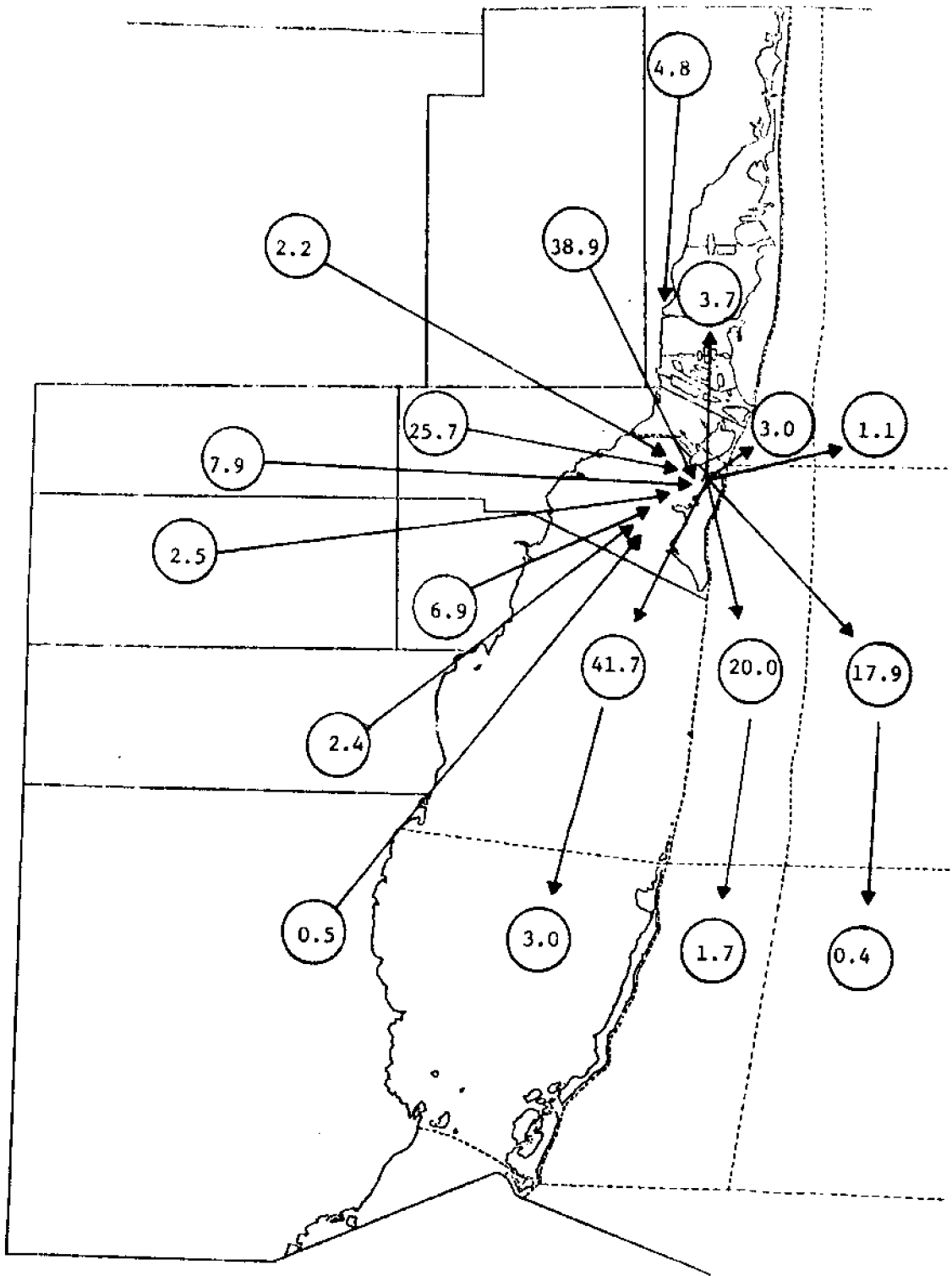


Figure 23. Crandon destination patterns: percent from each residence area and percent to each offshore destination area. (estimated from site interviews)

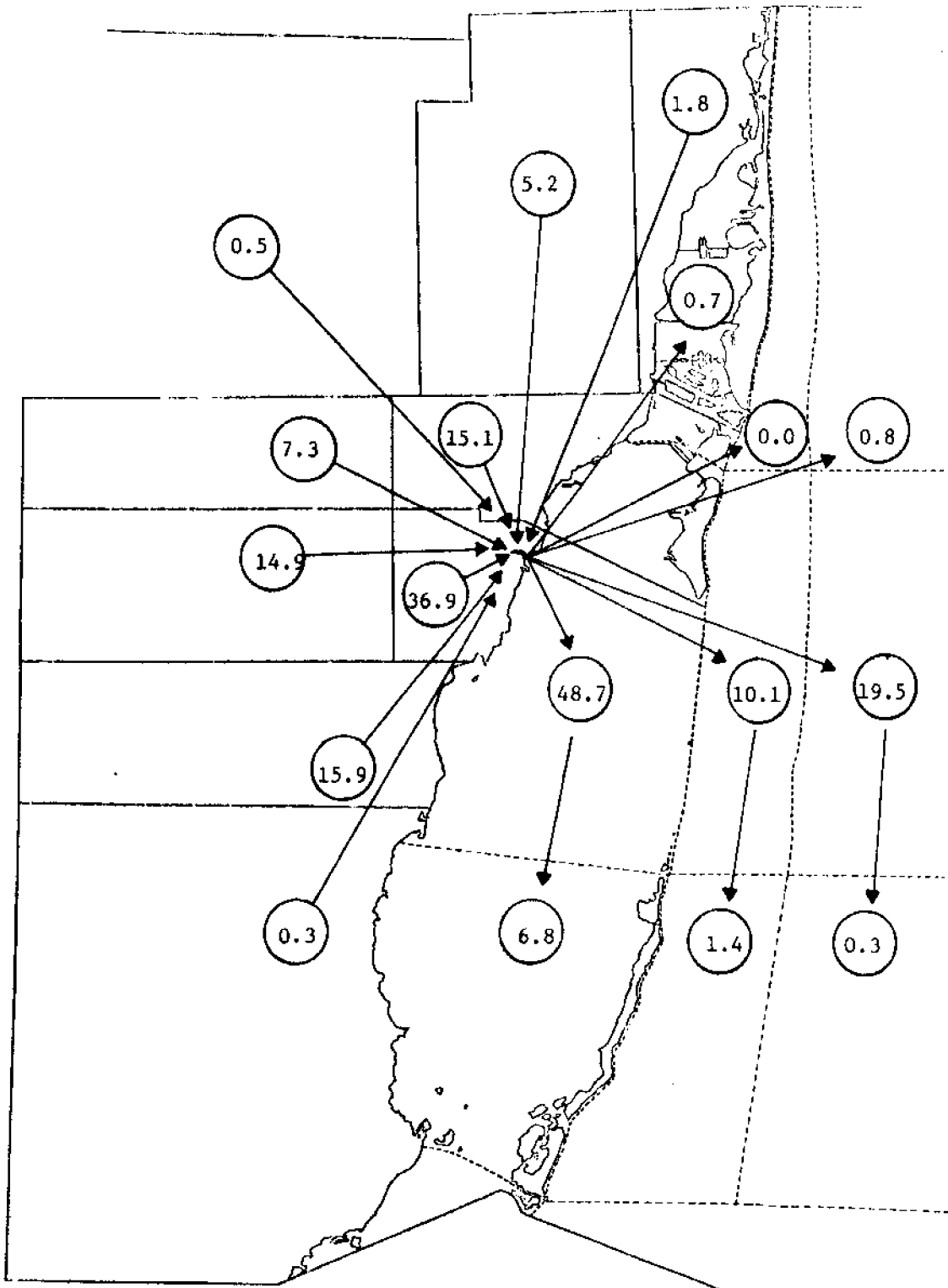


Figure 24. Matheson destination patterns: percent from each residence area and percent to each offshore destination area. (estimated from site interviews)

PROJECTIONS OF BOATING IN DADE COUNTY

Trips from County Marinas in 1975-76

The total number of recreational boating trips in Dade County is related to the total number of active boaters and the ability of marina facilities to accommodate these boaters. It is expected that the availability of facilities (parking, ramp and hoist for trailered boats and berths for larger boats) has significantly restricted the number of active boaters and the amount of boating. This is expected because all County parking/ramp facilities operate at near capacity and there is a definite shortage of berths at public and private marinas as manifested by waiting lists. The question of how many "inactive" trailerable boat owners would become more active or how many new boaters would be attracted to boating is an important question, unfortunately, it is one that cannot be satisfactorily answered by this study.

Trips by Trailerable Boats

Studying the existing distribution of registered trailerable boats in the County (boats less than 26 feet, Figure 6) reveals that the percent of households owning trailerable boats is positively correlated with the percent of single family homes and estimated average family income in each residence area. Table 13 indicates that the percent of people residing in single family houses and average family income are significantly higher for boaters than the County average. These two factors explain approximately

fifty percent of the variation in the percent of households owning boats in each area (low of 3.2% in area three, Miami Beach, to a high of 19.7% in area seven, South Coral Gables and South Miami).

It is anticipated that from 1975 to 1985 average real family income will increase in all areas, but the relative amounts in each area is unknown. Based on estimated population projections and zoning in the Dade County Master Plan, the percent of housing that is single family in each area (except area one) will decline but by differing amounts (Table 51). After numerous unsuccessful attempts to incorporate average family income and percent single family housing and other characteristics (e.g. average age or number of household members) into projecting the percent of families owning boats, this approach was finally abandoned. The projections assume that the percent of families owning boats (trailered and berthed) in each area will remain constant. This assumes the underlying relative socio-economic-demographic characteristics determining boat ownership (which were not adequately identified in the study) do not change. If changes do occur, the projections assume these changes offset each other (e.g. higher income but less single family housing) so that the percent of families owning boats does not change. This assumption results in a slight increase in the percent of all families in Dade County owning boats (from 6.2% in 1975 to 6.5% in 1985, Table 51). This occurs because of the relative projected population increases in the high boat ownership areas.

Table 51 indicates projected households and boats by area in 1985. If marina preferences did not change and the number of trips were proportional to the number of boats, then Tables 52-55 project the hypothetical total number of monthly trailerable boat trips from each residence area to each marina by season in 1985. This is hypothetical because the existing sites

TABLE 51
PROJECTED 1985 HOUSEHOLDS AND BOATS BY RESIDENCE AREA

Residence Area	% Single Family Residences	Average Family Income	Households	Trailer-able Boats	Berthed Boats	Total Boats	Trailer-able Boats/ Household	Berthed Boats/ Household	Total Boats/ Household
1 1975	70.0 ¹	11477 ¹	6642 ¹	266 ³	21 ³	287 ³	.040	.003	.043
1985	72.2 ²		17000 ²	678	53	731	.040	.003	.043
2 1975	50.0	12857	169272	8817	415	9232	.052	.003	.055
1985	48.7		195000	10243	482	10725	.052	.003	.055
3 1975	27.7	14979	156761	4462	603	5065	.028	.004	.032
1985	27.7		180000	5074	686	5760	.028	.004	.032
4 1975	56.2	19084	20952	1413	24	1437	.067	.001	.069
1985	54.0		37000	2510	43	2553	.067	.001	.069
5 1975	56.2	14464	83068	4819	713	5532	.058	.009	.067
1985	54.6		88000	5136	760	5896	.058	.009	.067
6 1975	20.0	20460	16379	353	6	359	.022	.001	.022
1985	13.6		33000	713	13	726	.022	.001	.022
7 1975	78.7	21840	17648	3129	356	3485	.177	.020	.197
1985	74.9		24000	4245	483	4728	.177	.020	.197
8 1975	79.7	12328	17359	3222	83	3305	.185	.005	.190
1985	67.1		25000	4631	119	4750	.185	.005	.190
9 1975	60.3	98.3	17863	2843	31	2874	.159	.002	.161
1985	56.5		31000	4937	54	4991	.159	.002	.161
All 1975	45.0	1275 ⁶	505944	29325	2252 ⁵	31577 ⁴	.058	.004	.062
Dade 1985	42.4		630000	38167	2693	40860 ⁴	.061	.004	.065

TABLE 51 CONTINUED

SOURCE:

- 1 Estimated from U.S. Bureau of the Census U.S. Census of Housing and Population. 1970.
- 2 Estimated from Metropolitan Dade County Planning Department Comprehensive Development Master Plan: Metropolitan Development. 1974.
- 3 From State of Florida. Department of Natural Resources List of Registered Boat Owners. 1975.
- 4 An estimated 13.1% of registered boats are registered to families residing outside Dade County. This brings the 1975 total registered boats to 35,923 and the 1985 projection to 46,490.
- 5 These figures represent only registered boats over 26'. In the wet berth survey of 1975, there were also 1622 registered boats under 26' in wet berths, 911 documented boats in wet berths, and 103 out of state boats in Dade County wet berths, for a total of 4934 berthed recreational boats in Dade County (see Table 6, total power and sail). Assuming the proportion of berthed-under-26' boats remains constant, and documented boats increase at the same rate as other berthed boats, it is projected that there will be 5881 berthed recreational boats in 1985 (not including out-of-state registered boats): 2099 registered boats under 26' 2693 registered boats over 26'; and 1089 documented boats.

TABLE 52

PROJECTED 1985 MONTHLY WINTER TRAILERABLE BOAT TRAFFIC WITH NO NEW MARINAS

Residence Area	MARINA						Total
	Haulover	North Bay	Crandon	Matheson	Homestead		
1	46.1	20.9	132.2	26.2	35.4		260.8
2	386.2	373.4	1064.8	125.0	72.4		2021.8
3	291.4	270.7	128.6	42.3	15.8		748.8
4	19.5	7.8	330.7	268.2	145.2		771.4
5	19.3	13.4	645.2	332.9	57.6		1068.4
6	9.5	0.0	119.0	625.4	151.1		905.0
7	2.2	6.0	220.6	1035.4	131.6		1395.8
8	2.3	2.7	81.3	473.0	408.0		967.3
9	0.0	0.0	20.5	10.8	1075.6		1106.9
Out of Dade Residents	171.6	43.8	244.1	61.7	136.0		657.2
Total Traffic	948	739	2987	3001	2229		9902
Existing Monthly Parking Capacity	2778	3036	5792	4374	3475		
Existing Monthly Ramp/Hoist Capacity	10,000+	6452	10,000+	7952	3861		

TABLE 53

PROJECTED 1985 MONTHLY SPRING TRAILERABLE BOAT TRAFFIC WITH NO NEW MARINAS

Residence Area	Haulover	North Bay	MARINA			Total
			Crandon	Matheson	Homestead	
1	129.2	46.1	172.5	29.6	65.5	442.9
2	1083.3	830.1	1389.8	140.2	140.3	3583.7
3	817.0	601.9	167.8	47.5	29.2	1663.4
4	54.9	17.4	432.0	301.0	269.6	1074.9
5	54.0	29.7	842.0	373.5	106.9	1406.1
6	26.7	0.0	155.3	699.0	280.7	1161.7
7	6.0	13.3	287.8	1163.0	244.2	1714.3
8	6.3	6.0	106.1	530.5	757.9	1406.8
9	0.0	0.0	26.7	12.2	1998.8	2037.7
Out of Dade Residents	481.2	97.3	318.6	69.2	253.1	1219.4
Total Traffic	2659	1642	3899	3366	4147	15711
Existing Monthly Parking Capacity	2778	3036	5792	4374	3475	
Existing Monthly Ramp/Hoist Capacity	10,000+	6452	10,000+	7952	3861	

TABLE 54

PROJECTED 1985 MONTHLY SUMMER TRAILERABLE BOAT TRAFFIC WITH NO NEW MARINAS

Residence Area	MARINA					Total
	Haulover	North Bay	Crandon	Matheson	Homestead	
1	102.1	41.8	302.7	44.6	89.9	581.1
2	855.9	748.4	2438.8	210.8	184.6	4438.5
3	645.7	542.4	294.7	71.4	40.1	1594.3
4	43.4	15.6	758.3	452.3	370.2	1639.8
5	42.7	26.9	1480.1	561.9	146.7	2258.3
6	21.2	0.0	272.1	1048.5	385.4	1727.2
7	4.7	11.9	505.4	1746.9	335.3	2604.2
8	5.0	5.5	186.1	797.1	1040.7	2034.4
9	0.0	0.0	46.9	18.2	2742.8	2807.9
Out of Dade Residents	380.3	87.7	559.4	104.0	346.8	1478.2
Total Traffic	2101	1480	6845	5056	5683	21,164
Existing Monthly Parking Capacity	2778	3036	5792	4374	3475	
Existing Monthly Ramp/Hoist Capacity	10,000+	6452	10,000+	7952	3861	

TABLE 55

PROJECTED 1985 MONTHLY FALL TRAILERABLE BOAT TRAFFIC WITH NO NEW MARINAS

Residence Area	MARINA							Total
	Haulover	North Bay	Crandon	Matheson	Homestead			
1	31.6	16.6	90.3	22.2	16.6			177.3
2	265.3	297.4	726.5	105.0	34.2			1428.4
3	200.1	215.5	87.8	35.6	7.4			546.4
4	13.5	6.2	225.5	225.5	68.6			539.3
5	13.2	10.7	440.5	279.6	27.2			771.2
6	6.5	0.0	81.2	524.3	71.3			683.3
7	1.5	4.7	150.6	869.9	62.1			1088.8
8	1.6	2.2	55.5	397.2	192.7			649.2
9	0.0	0.0	13.9	9.0	507.4			530.3
Out of Dade Residents	117.9	34.9	166.6	51.8	64.2			435.4
Total Traffic	651	588	2038	2520	1052			6849
Existing Monthly Parking Capacity	2778	3036	5792	4374	3475			
Existing Monthly Ramp/Hoist Capacity	10,000+	6452	10,000+	7952	3861			

cannot accommodate this amount of traffic so that if facilities are not expanded this traffic could not occur.

Existing Capacity

The existing capabilities of each marina to accommodate trailerable boats (based on existing boating time patterns) is at the bottom of Tables 52-55. Table 56 indicates which sites during which seasons cannot meet projected hypothetical 1985 trailerable boat traffic.

Minimum Required Parking and Ramp/Hoist Facilities to Meet Projected 1985 Traffic

The projected primary growth in trailerable boat traffic in the next ten years is in South Dade. North Dade (Haulover and North Bay) facilities are of adequate size (but not satisfactory condition) except for the spring when Haulover would operate at absolute maximum capacity.

Projected traffic will significantly exceed accommodations in South Dade (Crandon, Matheson, Homestead). Existing residence and offshore destination patterns (Figures 21-25) of those utilizing the South Dade sites suggests that the addition of new facilities at Chapman Field and Black Point (see Figure 11 for locations) will be primary alternatives for Matheson and Homestead traffic.

The addition of facilities at Black Point can be expected to draw approximately fifty percent of the trailerable boat traffic from Homestead. Presently, fifty six percent of all traffic at Homestead comes from residence areas north of Black Point (Figure 25). With the new expressway, Black Point will be easier to reach by automobile and is not significantly different from Homestead in terms of distances to expected offshore destinations. Black Point can also be expected to draw from Matheson traffic, especially for traffic originating from residence areas six,

eight, and south portion of seven. It is estimated that approximately thirty percent of Matheson's traffic would shift to Black Point.

The addition of facilities at Chapman Field would significantly draw on Matheson traffic and to some extent on Black Point traffic. However, the Chapman Field site is not expected to significantly influence Homestead traffic. It is estimated that the net influence if both Chapman Field and Black Point would be to draw approximately fifty percent of Matheson traffic.

It is unlikely that ramps at Black Point or Chapman Field will draw traffic from Haulover or North Bay. However, the addition of a hoist at Chapman Field can be expected to draw from the hoist traffic at Crandon that is from residence areas six, seven, and eight (presently 12.5% of traffic at Crandon is from these three South Dade areas). These areas have proportionately more large trailerable boats (Figure 6) which utilize hoists.

Table 57 estimates 1985 trailerable boat traffic with the addition of Black Point and Chapman Field. This is based on Black Point drawing fifty percent of Homestead traffic and Chapman Field drawing fifty percent of Matheson traffic and also drawing an undeterminable amount from Black Point. Without specific breakdowns on the traffic between Black Point and Chapman Field, Table 57 estimates the two sites together. A first approximation would be that the traffic would be divided approximately sixty percent for Black Point and forty percent for Chapman Field.

Without the addition of Black Point and Chapman Field, projected trailerable boat traffic could be accommodated by adding something less than fifty car-trailer parking stalls at Haulover, approximately fifty stalls at Crandon, approximately 50 at Matheson, approximately 80 at Homestead and

increasing the linear waterfront length of the ramp at Homestead to at least 150 feet.

TABLE 56

EXPECTED SHORTAGE OF PARKING AND RAMP/HOIST ACCOMMODATIONS
FOR 1985 TRAILERABLE BOAT TRAFFIC

Site	SEASON			
	Winter	Spring	Summer	Fall
<u>Haulover</u> parking ramp		maximum use		
<u>North Bay</u> parking ramp				
<u>Crandon</u> parking ramp/hoist			shortage	
<u>Matheson</u> parking ramp			shortage	
<u>Homestead</u> parking ramp/hoist		shortage shortage	shortage shortage	

Projected trailerable boat traffic at all seven sites can be accommodated with the addition of at least 125 feet of ramp and 150 car-trailer parking stalls each at both Black Point and Chapman Field and a hoist at Chapman Field. It is strongly recommended that Homestead ramp, hoist, and parking for trailerable boats not be expanded until after the completion of Black Point which is expected to significantly reduce Homestead traffic. It is further recommended that none of the other existing trailerable facilities (Haulover, North Bay, Crandon) be expanded until after Black Point and Chapman Field ramps, hoists, and parking are completed. However,

top priority should be given to improving the deteriorated and inappropriate facilities (e.g., ramp length and finger piers) at Haulover, North Bay, Crandon and Matheson.

TABLE 57

PROJECTED 1985 MONTHLY TRAILERABLE BOAT TRAFFIC WITH
THE ADDITION OF BLACK POINT AND CHAPMAN FIELD FACILITIES

<u>Marina</u>	<u>SEASON</u>			
	<u>Winter</u>	<u>Spring</u>	<u>Summer</u>	<u>Fall</u>
Haulover	948	2659	2101	651
North Bay	739	1642	1480	588
Crandon	2697	3509	6164	1838
Matheson	1500	1700	2500	1300
Chapman Field and Black Point*	2890	4190	6080	2000
Homestead	1100	2100	2900	500
Total	9874	15800	21,225	6877

* With hoist at Chapman Field.

Berthed Boat Traffic

Attempts were made to correlate percent of families owning berthed (over 26 feet) boats with socio-economic-demographic characteristics but this was as unsuccessful as attempts with trailerable boats. However, as was expected, berthed boat ownership is not significantly correlated with single family housing because berthed boats are not kept at home. Assuming that the percent of families owning berthed boats remains constant in each

area (which requires all the assumptions enumerated for trailerable boat projections), Table 51 indicates total registered boat ownership by area for boats over 26 feet. We feel this assumption is very tenuous and probably significantly underestimates what would occur if berths were actually available. Comparing the distribution of berthed boat owners with the distribution of berths in Dade County (comparison of Table 51 with Figures 7, 8, and 9), indicates that there would be a strong demand for berths in South Dade (South of Rickenbacker Causeway). This is further substantiated by the offshore destination patterns of berthed size boats.

It is estimated that at least 500 slips for boats from 25-40 feet would be immediately occupied at existing dockage rates or rates as high as eight cents per foot per day (\$2.40 per foot per month). There is such a shortage of dockage in Dade County that however many berths that could physically be provided at Black Point, Chapman Field, and the expansion Homestead (up to 1000-1200) would not eliminate shortages of dockage much less accommodate potential growth through 1985.

A Caveat on Boating Projections

It must be remembered that it is assumed that boating will increase according to the projected population increases in each residence area. If population increases in the projected fashion the estimates of boating traffic are absolute minimum estimates because they assume improved facilities will not influence boating activity. That is, new marinas will not encourage "inactive" boaters to utilize their boats more frequently or encourage new boat owners because of the new facilities. The experiences of other communities suggest that new recreational facilities do significantly encourage more recreation, particularly when existing facilities are operating near capacity which is the situation in Dade County with

regards to trailerable and berthed boats. Therefore, the minimum new ¹¹⁹ facilities to accommodate projected 1985 traffic does not provide for less crowded facilities than already exist, but only so that congestion does not become "worse" than presently exists.

Given the number of people serviced by marinas, their socio-economic demographic characteristics, and the economic impact of recreational boating, it would appear that serious attention should be given to improving facilities for trailerable and berthed boats beyond the levels that presently exist. This study provides the baseline data on boating to evaluate such decisions, but it is beyond the scope of this study to arrive at such recommendations because the ultimate decisions must evaluate all the alternative uses for public funds.

APPENDIX I

VARIABLES RECORDED AND EXHIBITS OF QUESTIONNAIRES

Variables Recorded in the Study by Data Source

1. 1975-76 State of Florida registered boats:
 - county of registry
 - year built
 - length in feet
 - beam in feet
 - registration number
 - name of owner
 - address of owner
 - zip code of owner
 - make of boat
 - type use: (pleasure, commercial, dealer)
2. 1970 U.S. census data:
 - county
 - census tract
 - zip code
 - population: age, race, Spanish speaking
 - number of housing units: single family, multifamily
 - average number of persons per household
 - year family moved into house
 - average family income
 - average house value
 - average gross rent
3. Wet berth boat survey:

type boat: power, sail, commercial, non-power floating homes

type power: outboard, outdrive, inboard, none

length classification: 16, 16-25, 26-39, 40-64, 65+

registry: Florida, documented, out-of-state

location of berth

type facility: private (individual) slip, marina (organized docks)

4. Marina operators telephone survey:

name of facility

type facility: commercial, public, private

private membership: total, number owning boats

location

number of berths: wet, dry

ramp: width in feet, capability to accommodate float-on trailers

hoist: number, weight capacity

charge for berths: wet, dry

charge for ramp

charge for hoist

fuel available: gas (regular, premium) diesel

5. Site interviews of boaters:

marina interview site: Haulover, North Bay, Crandon, Matheson,
Homestead

mooring type: trailer, wet berth

day of week: weekday, weekend

month

boat length in feet

boat type: outboard, outdrive, inboard, sail

number of people in party

primary departure site if other than interview site

zip code of residence

departure or launch time

return time

primary offshore activity: cruise, water surface contact (e.g., swim, ski), dive, line fish, spearfish, hand fish, commercial fish, business related, land activity, other

primary offshore destination

line fishing method: troll, bottom, cast/spin/drift

spearfishing method: skin, SCUBA, Hawaiian sling, trigger activated gun

number of lines fished (or divers in the case of spearfishing)

number of hours fished

species sought fishing: first sought, second sought, third sought

species caught fishing: number of species

fork length of species caught (subsample of site interviews)

6. Questionnaires dispersed with site interviews

interview site where questionnaires were dispersed: Haulover, North Bay, Crandon, Matheson, Homestead

mooring type: trailer, wet berth

boat type: outboard, outdrive, inboard, sail

boat length in feet

construction material: fiberglass, wood, metal, other

type fuel: gas, diesel

horsepower

year built

year purchased

value of boat in hundreds of dollars

electronics: marine receiver, marine transmitter, C.B.

average travel time in minutes to marina

average travel time in miles to marina

normal departure time: pre 600, 600-900, 900-1200, 1200-1500, 1500-1800, post 1800.

normal return time: pre 600, 600-900, 900-1200, 1200-1500, 1500-1800, post 1800

percent of boating on weekends

activity for which boat most frequently used: cruise, water surface contact (e.g., swim, ski), skin dive, SCUBA dive, linefish, spearfish, commercial fish, business related, land activity, other (specify)

second, third, fourth most frequent boating activities

offshore destination areas for each activity

primary departure site if other than interview site

area of residence

average number of trips per month in the summer (Apr.-Sept.)

average number of trips per month in the winter (Oct.-Nov.)

average number of persons per trip

average number of family members per trip

estimated number of trips per month to make it worthwhile to own boat

percent of boating devoted to fishing: line fishing, spearfishing

type line fishing: bottom, troll, cast/spin/drift

type spearfishing: Hawaiian sling, trigger operated gun, skin, SCUBA

other type fishing: hand, net, other (specified)

first, second, third most frequent type fishing

average fuel consumption per trip in gallons

average expenditures per trip for supplies other than fuel

average monthly boat ownership costs

average percent of fuel purchased at interview site

average percent of supplies other than fuel purchased at interview site

average percent of family's total recreational budget spent on recreational boating

average percent fuel price increase in 1974-75 reduced boating

fuel prices influence on choice of boat: yes, no

expected fuel price in 1977: gas, diesel

would purchase larger boat if dockage was available at site interview marina for \$1.50 per foot per month: yes, no

would purchase larger boat if dockage was available at site interview marina for \$3.00 per foot per month: yes, no

present method of dockage charge: by feet, by slip

total dockage charge: 1974, 1975, 1976

average percent of launchings by hoist

average hoist waiting time: in, out

primary reason for using hoist: easier, protects trailer

location of boat during hurricane

first through last (up to nine) most desired changes (or improvements) at interview site marina

age of boat owner

number of years a Dade County resident

number of family members living at home

type home: apartment, townhouse, condominium, mobile home, single-family house

type employment: trade, technical, professional, administration/office, management, self-employed, student, retired

hours of employment: day, night, shift

gross family income in thousands of dollars: 0-5, 5-10, 10-15, 15-20, 20-30, 30+

most important outdoor recreational activity other than boating: salt-water oriented, freshwater oriented, golf, tennis, spectator sports, none, others (specified)

written comments on what would make recreational boating better

7. Questionnaire mailed to registered boaters:

All the variables included in the questionnaire dispersed with site interviews plus:

storage of boat: trailer at home, trailer dry storage, untrailered dry storage, wet berth at home, wet berth at marina (county, city, private, club)

first, second, third species of fish most frequently fished (by actual time fishing)

first, second, third species of fish most frequently caught (by number of fish kept)

previously interviewed at one of the five marina sites: yes, no, number of times

previously completed a questionnaire dispersed with site interviews: yes, no

8. Aerial offshore boat survey:

number of boats in each offshore destination area: sail, power

number of boats offshore in the study areas at approximately 1200 hours

Exhibits of Questionnaires

UNIVERSITY OF MIAMI
CORAL GABLES, FLORIDA 33124

SEA GRANT ADMINISTRATIVE OFFICE
P. O. BOX 249178

Dear Fellow Boater:

The University of Miami in conjunction with the National Sea Grant Program (National Oceanic and Atmospheric Administration, Department of Commerce) and Dade County are conducting a survey of recreational boating in Dade County. If you trailer your boat to a County marina one of our staff members will have personally supplied you with this form. If you keep your boat in the water, one of our staff members will have personally placed this form on your boat.

Many boaters think they know how important boating is as a valuable recreational experience and as an important economic sector of our community. Concern over marinas and other facilities and services supporting recreational boating is frequently heard, yet there often does not appear to be any concrete steps taken in the right direction.

Sea Grant and Dade County are embarked on an assessment of recreational boating that will make a difference. This is your opportunity to make a contribution to the future direction of facilities and services that support recreational boating. This includes the protection and enhancement of our natural resources.

I wish to personally assure you that it is worth your time (and our time) to complete the attached form. While we are not recording your name, the specific information you provide is considered strictly confidential and will only be released in a form that will respect your personal privacy.

If you have any questions about our scope or intentions you may call me personally at the Rosenstiel School of Marine and Atmospheric Science tel. 350-7297.

Good (and hopefully better) boating,



C. Bruce Austin, Ph.D.
Director, Dade County/Sea Grant
recreational boating assessment program

CBA/sar

EXHIBIT II

SAMPLE QUESTIONNAIRE DISPERSED AT MARINAS

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UNIVERSITY OF MIAMI / NATIONAL SEA GRANT / DADE COUNTY

RECREATIONAL BOATING SURVEY QUESTIONNAIRE

Circle the appropriate items(s) or fill in the blanks. Please feel free to write an answer that cannot be adequately expressed by circling or filling in a blank.

Type of boat: Power; Sail
Overall length of boat in feet:
Construction Material: Fiberglass; Wood
Type of Engine: Gas; Diesel
Total Horsepower:
Year Boat was Built: 19
Year you purchased the Boat: 19
Approximate Value of the Boat in dollars:
Electronics: s/w receiver and transmitter; s/w receiver

Average travel time from home to marina in minutes:
Average travel distance from home to marina in miles:
Primary marina departure time: 6-9; 9-12; 12-3; 3-6; return time: 6-9; 9-12; 12-3; 3-6
Percent of boating done on weekends:

- Indicate the uses of your boat in order of frequency:
Business related recreation
Cruising (motor or sail)
water surface contact sports (swimming, skiing)
Snorkeling/skin diving
SCUBA diving
line fishing
spearfishing
commercial fishing
Other (specify):

Indicate on the chart on the back side of this page your primary shore departure site and offshore destination areas. Mark the chart with the numbers corresponding to activities in the previous question. For example, if you have indicated line fishing as number 1, then place a large "1" on the chart where you primarily fish.

Please indicate on the back side of this page approximately where you live

Average number of trips per month: summer (April-September)
Average number of trips per month: winter (October-March)
Average number of people per trip:
Average number of family members per trip:

In your opinion what is the minimum number of trips per month that makes it worthwhile for you to own your boat:

Percent of boating devoted to line fishing and/or spearfishing:

Indicate the type fishing in order of frequency:

- Line fishing: bottom, troll, cast/spin
Spearfishing: aling, trigger, operated gun
skin diving
SCUBA
Netting or hand catching: lobster, tropical fish
Other: specify:

Average fuel consumption per trip in gallons:
Average expenditures per trip for supplies other than fuel (all people on the boat) in dollars:
Average monthly ownership costs (mortgage, maintenance) in dollars:
Percent of fuel purchased at this marina:
Percent of supplies other than fuel purchased at this marina:
Recreational boating is what percent of your family's total recreational budget:

EXHIBIT II CONTINUED

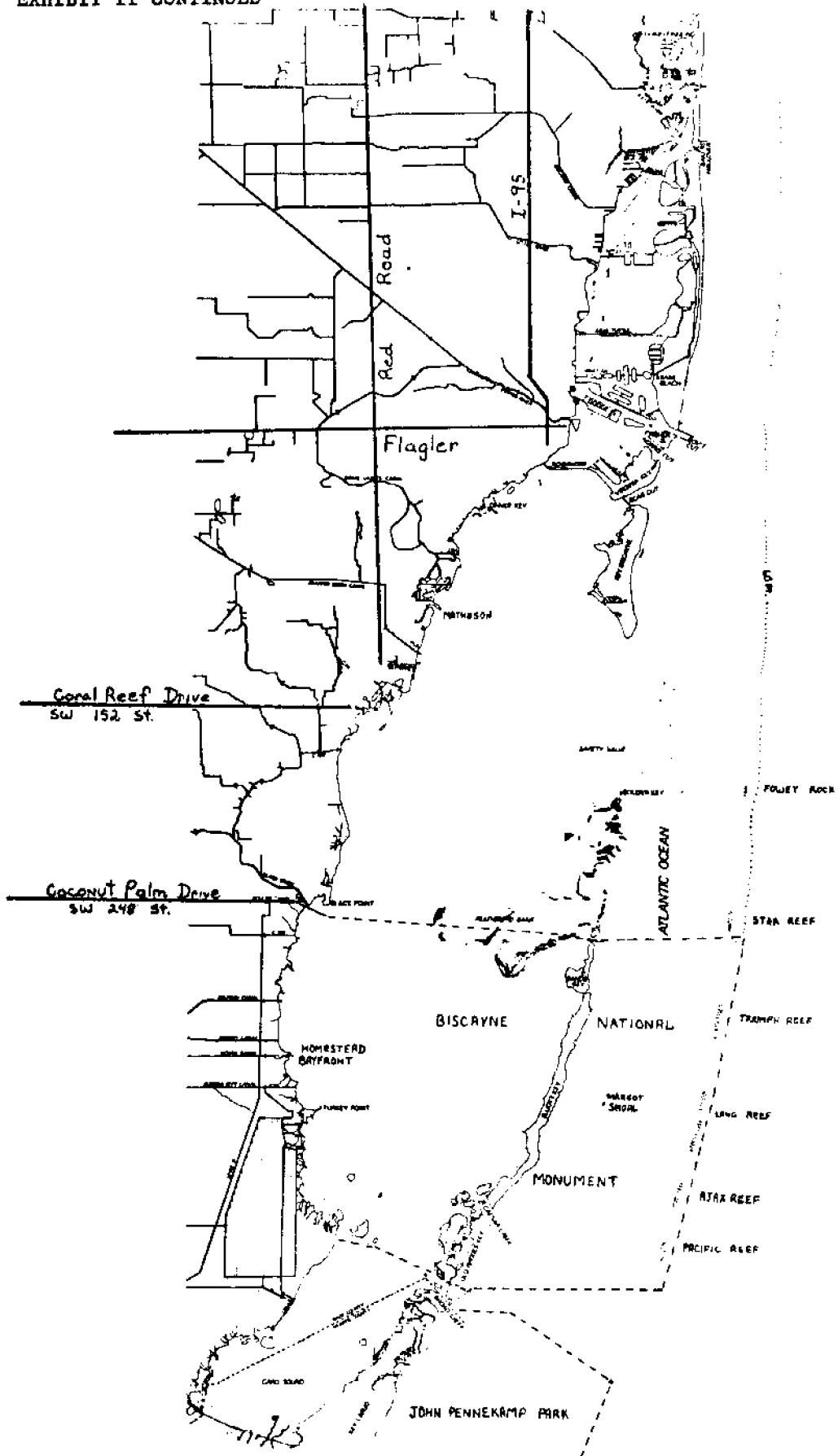


EXHIBIT II CONTINUED

Have increase fuel prices in 1974 and 75 reduced the amount of your boating: no; if yes, by approximately _____ percent.

Have increased fuel prices influenced the boat you purchased: I purchased my boat before fuel prices went up; no; yes

What do you expect fuel prices to be next year in cents per gallon: _____ (Circle whether you refer to GAS or DIFSEL)

Would you purchase a larger boat if you were assured dockage space at this marina at \$1.50 per foot per month _____; at \$3.00 per foot per month _____.

If you rent a berth, how are you charged: by the foot; by the slip
Monthly dockage charge: 1974 _____; 1975 _____; 1976 (est.) _____

If you have a trailered or dry storage boat, what percent of your launchings are by a hoist: _____

What is the average waiting time to use the hoist: in _____; out _____
Why do you use the hoist (number in order of priority): easier _____; saves trailer _____; don't use the hoist _____

If you could trade your boat tomorrow for another boat of equivalent value what would you trade for: would not trade; would trade according to the characteristics I will enumerate to the right of the first eight questions (page 1).

Where will you keep your boat in case of hurricane: _____

Indicate what changes at the marina would be beneficial to you in order of importance (please enumerate specific changes):

- _____ longer operating hours: From _____ To _____
- _____ sale of additional supplies: enumerate: _____
- _____ sell mechanical and other repair services: specify: _____
- _____ more security
- _____ more parking
- _____ more ramp space
- _____ better fueling accommodations: specify: _____
- _____ methods of charges or payments: specify: _____
- _____ other: Specify _____
- _____ special "non-boating" facilities such as:
 - _____ snack bar
 - _____ restaurant
 - _____ park
 - _____ picnic area
 - _____ fishing pier
 - _____ bike path
 - _____ swimming
 - _____ other: specify _____

COMMENTS: WHAT COULD BE DONE TO MAKE MARINAS OR ANY ASPECT OF RECREATIONAL BOATING BETTER?

Age of the owner of the boat: _____
 Number of years a resident of Dade County: _____
 Number of members in your family living at home: _____
 Type of home: apartment; townhouse; condominium; mobile home; single-family house
 Type of employment: trade; technical; professional; administration/office; management; self-employed; student; retired
 Hours of employment: day; night; shift
 Approximate gross annual family income in thousands of dollars: 0-5; 6-10; 11-15; 16-20; 20 +
 Most important outdoor recreational activity other than boating: salt-water oriented; freshwater oriented; not water oriented; golf; tennis; spectator sports; none; others (please specify): _____

SAMPLE COVER LETTER ACCOMPANYING QUESTIONNAIRE MAILED TO REGISTERED BOATERS

UNIVERSITY OF MIAMI
CORAL GABLES, FLORIDA 33124SEA GRANT ADMINISTRATIVE OFFICE
P. O. BOX 249178

Dear Fellow Boater:

The University of Miami in conjunction with the National Sea Grant Program (National Oceanic and Atmospheric Administration, Department of Commerce), Dade County, and National Park Service are conducting a survey of recreational boating in Dade County. If you utilize a County marina (Haulover, North Bay, Crandon, Matheson, Homestead), you may have encountered one of our staff members at the ramp or docks.

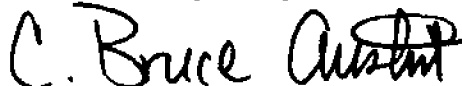
In order to obtain a profile of all recreational boating in Dade County (not just that departing from County marinas), this questionnaire has been mailed to a select sample of registered boaters. If you have already completed a questionnaire from a County facility, it is important that you also complete this form.

Many boaters think they know how important boating is as a valuable recreational experience and as an important economic sector of our community. Concern over marinas and other facilities and services supporting recreational boating is frequently heard, yet there often does not appear to be any concrete steps taken in the right direction. We are embarked on an assessment of recreational boating that will make a difference. This is your opportunity to make a contribution to the future direction of facilities and services that support recreational boating. This includes the protection and enhancement of our natural resources.

I wish to personally assure you that it is worth your time (and our time) to complete the attached form. While we are not recording your name, the specific information you provide is considered strictly confidential and will only be released in a form that will respect your personal privacy.

If you have any questions about our scope or intentions you may call me personally at the Rosenstiel School of Marine and Atmospheric Science, telephone 350-7297.

Good (and hopefully better) boating,

C. Bruce Austin, Ph.D.
Director, Recreational Boating
Assessment Program

CBA:dkk

SAMPLE QUESTIONNAIRE MAILED TO REGISTERED BOATERS

UNIVERSITY OF MIAMI / NATIONAL SEA GRANT / DADE COUNTY / NATIONAL PARK SERVICE

RECREATIONAL BOATING SURVEY QUESTIONNAIRE TO REGISTERED BOAT OWNERS

Circle the appropriate item(s) or fill in the blanks. Please feel free to write an answer that cannot be adequately expressed by circling or filling in a blank.

Type of boat: Power, sail
 Overall length of boat in feet: _____
 Construction material: Fiberglass, wood, metal
 Type of engine: Gas, diesel
 Total horsepower: _____
 Year boat was built: 19__
 Year you purchased the boat: 19__
 Approximate value of the boat in dollars: _____
 Electronics: S/W receiver and transmitter, S/W receiver, CB, none

How do you store your boat? Trailered at home, trailered dry storage, wet berth at home, wet berth at a marina, untrailered dry storage
 If you keep your boat at a marina, what type of a marina is it? County, city, private, club
 If you rent a berth, how are you charged? By the foot, by the slip
 Monthly dockage charge: 1974____, 1975____, 1976____
 If you have a trailered or dry storage boat, what percent of your launchings are by hoist? _____%
 Why do you use the hoist (number in order of priority)? Easier____, Saves trailer _____

Indicate the uses of your boat in order of frequency:
 _____ Business related recreation
 _____ Cruising (motor or sail)
 _____ Water surface contact sports (swimming, skiing)
 _____ Snorkeling/skin diving
 _____ SCUBA Diving
 _____ Line fishing
 _____ Spearfishing
 _____ Commercial fishing
 _____ Other (specify): _____

Indicate on the chart on the back side of this page your primary offshore destination areas. Mark the chart with the numbers corresponding to activities in the previous question. For example, if you have indicated line fishing as number 1, then place a large "1" on the chart where you primarily fish.

Average number of trips per month: summer (April-September) _____
 Average number of trips per month: winter (October-March) _____
 Average number of people per trip: _____
 Average number of family members per trip: _____

In your opinion what is the minimum number of trips per month that makes it worthwhile for you to own your boat: _____

Percent of boating devoted to line fishing and/or spearfishing: _____%

Indicate the type of fishing in order of frequency:

Line fishing:	Spearfishing:	Netting or hand catching:
_____ bottom	_____ aling	_____ lobster
_____ troll	_____ trigger operated gun	_____ tropical fish
_____ cast/spin	_____ skin diving	Other: (specify): _____
	_____ SCUBA	

List the three most important (according to time spent fishing) species of fish for you: 1. _____
 2. _____
 3. _____

EXHIBIT IV CONTINUED

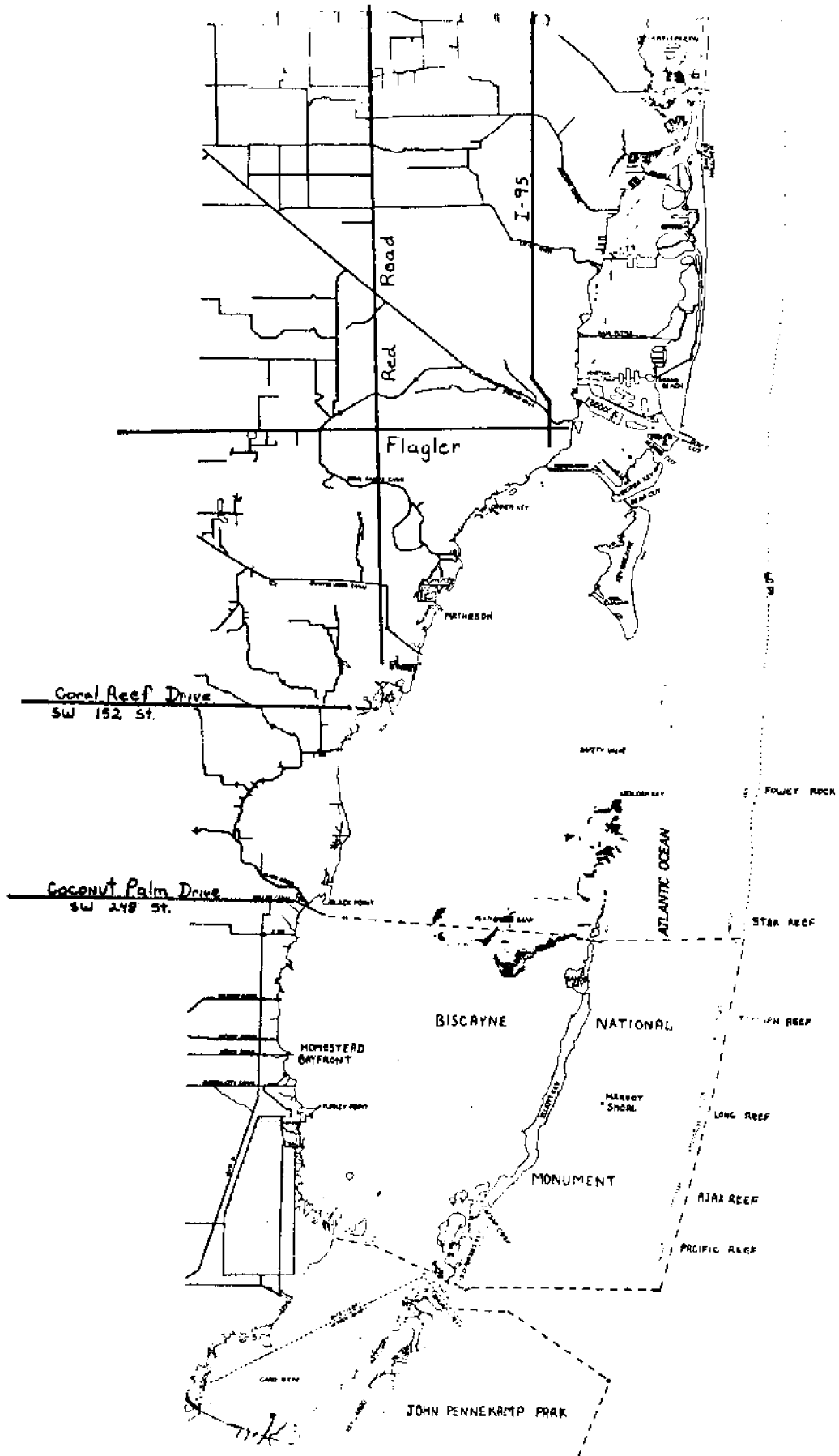


EXHIBIT IV CONTINUED

List the three most frequently caught species of fish (according to number of fish taken home:) 1. _____
2. _____
3. _____

Average fuel consumption per trip in gallons: _____
Average expenditures per trip for supplies other than fuel (all people on the boat) in dollars: _____
Average monthly ownership costs (mortgage, maintenance) in dollars: _____
Percent of fuel purchased at marinas: _____
Percent of supplies other than fuel purchased at marinas: _____
Recreational boating is what percent of your family's total recreational budget: _____%
Have increased fuel prices in 1974 and 1975 reduced the amount of your boating? No, if yes, by approximately _____ percent.
Have increased fuel prices influenced the boat you purchased: I purchased my boat before fuel prices went up; no; yes
What do you expect fuel prices to be next year in cents per gallon: _____
(Circle whether you refer to GAS or DIESEL).
If you trailer your boat, would you purchase a larger boat if you were assured dockage space at a county marina at \$1.50 per foot per month _____; at \$3.00 per foot per month _____?

Primary departure site: _____
Average travel time from home to marina in minutes: _____
Average travel distance from home to marina in miles: _____
Primary marina departure time: _____ Return time: _____
Percent of boating done on weekends: _____
Where will you keep your boat in case of hurricane: _____

Home zip code: _____
Age of the owner of the boat: _____
Number of years a resident of Dade County: _____
Number of members in your family living at home: _____
Type of home: townhouse, apartment, condominium, mobile home, single-family house
Type of employment: trade, technical, professional, administration/office, management, self-employed, student, retired
Hours of employment: day, night, shift
Approximate gross annual family income in thousands of dollars: 0-5, 6-10, 11-15, 16-20, 20-30, 30+
Most important outdoor recreational activity other than boating: salt-water oriented, freshwater oriented, not water oriented, golf, tennis, spectator sports, none, others (please specify): _____
Have you ever been interviewed by one of our staff at any of the county marinas? Yes, no If yes, how many times? _____
Have you ever filled out one of the written questionnaires dispersed at the county marinas? Yes, no

COMMENTS: WHAT COULD BE DONE TO MAKE RECREATIONAL BOATING BETTER?

APPENDIX II

STUDY METHODS

Interviews at Marinas

Instead of attempting to interview every "kth" boater at boat ramps, the interviewer selected a specific portion of the ramp to monitor (ranging from 60 feet to the entire ramp depending on traffic). Each trailerable boat owner was interviewed after he retrieved his boat from the water and moved his rig off the ramp. The most convenient time of interview was while he was securing his boat to the trailer before leaving the marina. Immediately after the interview the boater was asked to take home and complete a written questionnaire to be returned in a self-addressed stamped envelope.

Berthed boat owners were interviewed as they returned to their slips. On most days traffic was light enough so that all berthed boat owners could be interviewed. They were not offered a written questionnaire because questionnaires were physically placed on each berthed boat in the marina (in a plastic water-proof envelope).

The amount of sampling that was done at each marina was not proportioned according to the expected amount of traffic at each marina. This was not done for two reasons. First, the relative amount of traffic at each site or all County operated marinas compared to total boating was not known. Second, a method was devised that eliminated the necessity of stratifying sampling based on expected relative traffic in order to obtain unbiased estimates of total boating. This method is described later in the Appendix.

Sampling days were assigned to the five County operated marinas according to six-week schedules. Each site was monitored from 0600-1800

hours one weekend day per week and each weekday once during the six-week sampling schedule. Four six-week schedules were planned according to four expected seasonal trends (winter, January-March; spring, April-June; summer, July-September; fall, October-December).

Questionnaires Mailed to Registered Boaters

Registered boaters were divided into zip code residence areas then 1200 questionnaires were mailed stratified on the basis of the relative number of boats in each zip code area. It was not necessary to randomize the selections within each zip code because the order of names appearing in the registration file was random.

Estimation of Total Daily Boat Traffic at Each County Operated Marina

At the beginning of the study the actual number of departures and returns by trailerable boats were monitored by a road traffic counter. Berthed boat traffic was monitored by counting vacant berths at one-hour intervals. The road counter was not satisfactory because there was considerable extraneous traffic (primarily sightseeing). Counting vacant berths was not satisfactory because it only indicates the number of boats away from the dock at that particular time.

The method utilized for estimating total daily boat traffic at each marina draws on the proposition (later verified) that boaters have distinguishable and relatively stable daily time preferences for boating with regards to their primary offshore activity and destination area. At each marina the primary offshore destination area was normally bay, reef, or stream at the same latitude as the marina (Figures 21-25) and dictated by the primary activity (Figure 19). Table 22 indicates time patterns by primary activity. If the proportion of total traffic engaged in each

activity (activity mix) is known, then aggregate daily time curves for all activities can be constructed (Figures 13 and 14).

Time Curves For Each Activity	Activity Mix	Aggregate Time Curve
$\begin{bmatrix} D-R_{11} & D-R_{21} & D-R_{31} & D-R_{41} & D-R_{51} \\ & & " & & \\ & & " & & \\ & & " & & \\ D-R_{18} & D-R_{28} & D-R_{38} & D-R_{48} & D-R_{58} \end{bmatrix}$	$\begin{bmatrix} n_1/n_T \\ " \\ " \\ " \\ n_5/n_T \end{bmatrix}$	$= \begin{bmatrix} D-R_{A1} \\ " \\ " \\ " \\ D-R_{A8} \end{bmatrix}$

D-R: Cumulative percent of departures minus returns (percent of boats offshore).

First subscript: offshore activities 1-5.

Second subscript: time intervals 1-8.

n_1 : Number of boats engaged in activity 1.

n_T : Total boats.

The activity mix was estimated from site interviews. Once the aggregate time curve that applied to a marina was constructed, total daily traffic could be readily estimated by dividing observed empty boat trailers and vacant berths at a particular time by the percent of boats that were indicated as being offshore at that time by the time curve.

Given the enumerable activity mixes at different marinas and at different offshore destination areas, aggregate time curves were simulated on an analog computer where activity mixes and individual activity time curves could be easily altered to generate the appropriate aggregate time curves (Austin and Siefert, 1976). A "methods manual" is presently being written on the use of time curves for estimating total boating traffic at shore departure and return ports and at offshore destination areas. This publication will be available from University of Miami Sea Grant in 1977.

Estimation of Total Daily Boat Traffic in Dade County

It was suspected that a considerable proportion of Dade County boating originated at County operated marinas, but what proportion was unknown. Boats in all offshore destination areas (Figure 3) were counted from a small fixed-wing aircraft on randomly selected days chosen from the population of days when marina site interviews were being conducted. The basic problem was to transform "instantaneous" boat counts into an estimate of traffic for the entire day. The problem was similar to the one of estimating total traffic at a marina. The difference was that the activity mix passing through each marina was known from site interviews, therefore, aggregate time curves could be constructed from which instantaneous counts could be translated into estimates of total daily traffic.

The activity mix was not known for each offshore area (bay, reef, stream; north, middle, south). While sampling was not stratified according to expected traffic at each sampling site, it was assumed that samples aggregated over sampling sites of boaters going to the same offshore destination was representative of the activity at that destination area. This permitted the construction of aggregate time curves for each offshore destination area. The number of boats counted in each offshore area during the aerial census could then be transformed into estimates of total daily traffic in that area by using the appropriate aggregate time curve. This method facilitated estimates of total boating traffic in the County (by activity) without having to stratify sampling according to the expected (but unknown) amounts of traffic passing through each departure site.

Estimation of Daily Boating Traffic by Activity by Offshore Destination Area

After total daily traffic was estimated from transforming instantaneous boat counts from the aerial census into estimates of total daily

traffic at each offshore area by using the appropriate aggregate time curve, the amount of traffic in each category (e.g., cruising, surface contact, linefishing) could be computed directly from the known activity mix in that area. At first glance the method may appear circular in that the activity mix must be known to construct aggregate time curves to estimate total traffic then the mix is used again to calculate traffic by activity. In the first case only percentages are stipulated. In the second calculation absolute numbers of trips by activity are derived.

Estimation of Seasonal Boating Traffic by Offshore Destination Area

Fluctuations in the amount of boating traffic within sampling periods (seasons) was caused primarily by weather conditions. Air surveys were too few for an accurate estimate of weekday or weekend daily traffic. A method of adjusting air counts to reduce the effect of weather conditions on the count days was devised. Boats departing from County marinas constitute a majority of the boating traffic in the County. Fluctuations in trailer and berth counts were considered an accurate proxy for fluctuations in total daily trips due to weather. Air counts were combined with trailer and berth counts on the same days to generate a traffic coefficient "c." The mean of these traffic coefficients and the mean trailer and berth counts were used to estimate mean daily traffic. The large sample size of trailer and berth data permitted a better estimate of mean daily traffic than air counts alone. Traffic coefficients were calculated for each area:

$$c_{ij} = \frac{\text{air count}_{ij}}{\Sigma \text{12:00 boat counts at County marinas}}$$

i = specific offshore area

j = specific day

$$C_i = \frac{\sum c_{ij}}{n}$$

n = number of flight days in the sample period

Mean daily total traffic (T) in a given area and sample period was computed by:

$$T_i = C_i N (D-R)_i$$

N = sum of the mean trailer plus berth counts from five County marinas

$(D-R)_i$ = percentage of total daily traffic offshore at 12:00 based on the aggregate time curve for area i .

Mean daily total trips were estimated in each of the offshore areas for each period. Multiplying by the number of days in the period and summing seasonally gives total season boat trips. The number of trips for each activity was computed from the activity mix in each area for each period.

Estimation of Total Catch of Major Species of Fish

The number of fish caught by species by offshore area by season was estimated by multiplying the mean catch by species by area by season per fishing trip (from site interviews) times the number of estimated fishing trips to each offshore area each season. No relationship could be established between species sought and caught. Catch composition could only be related to offshore area fished, season, and gear or methods which were determined primarily by angler expectations about the relative abundance of the more popular species.

Estimation of Fuel Consumption and Trip Supplies

Both fuel consumption and trip supplies per trip are correlated with the size and type boat (Table 42). Estimates of fuel consumed and supplies purchased by boaters utilizing County marinas was calculated by multi-

plying average fuel and trip supplies (estimated from questionnaires) times the number of trips from the marinas by each category of boat.

Fuel consumption and trip supplies for all boating in the County was estimated by the same method used for marinas. In the case of marina estimates the number of trips by each category of boat was known from site interviews. While it was expected that a given size and type boat utilizing a County facility would be representative of a similar size and type boat utilizing other facilities, it was not known if samples from County marinas accurately reflected total County trips by size and type boats. The aerial boat census counted all boat traffic in the County but could not distinguish size classifications. Therefore, knowing total trips per season (Table 28, column 7), the number of trips in each size and type category were assigned according to the relative number of boats in these size and type categories as indicated by boat registrations (Tables 3 and 4).

Further Information on Methods

It is anticipated that future studies of this type in other communities and updates of such studies will be conducted. This study was a "first try" at documenting a large amount of multiple activity boating from numerous departure and return shore locations over a relatively large water surface (approximately 200 square miles). The project was relatively expensive requiring the full-time efforts of four persons and the part time assistance of five graduate students over fifteen months.

Much has been learned to reduce costs, improve estimates, and formalize the use of such useful tools as time curves. In 1976-77 the University of Miami Sea Grant Program is sponsoring a project to write a Manual for Assessing Marine Coastal Recreational Boating. This document

will be available in the Fall of 1977 and details the methods utilized in this study and develops technical methods and concepts that should be helpful for future studies of this type.

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