

SEASONALITY OF FISHES ON A SOUTH FLORIDA SHORE¹

VICTOR G. SPRINGER AND ANDREW J. McERLEAN
Florida State Board of Conservation Marine Laboratory, St. Petersburg

ABSTRACT

Monthly collections on a grassy shore on Matecumbe Key, Florida Keys, were made from March, 1960, through February, 1961. One hundred and six species of fishes were taken. Number of specimens, size range and average size are given for each month for each species. Numbers of species and specimens were greatest during summer and fall. Approximately one-third of the species were represented only by young.

INTRODUCTION

Ichthyological literature on seasonal abundance of marine fishes in low latitudes is for the most part restricted to studies of only one or a few species. One reason for this can be ascribed to the difficulty of identifying the large numbers of species present in warm latitudes. Recent advances in the taxonomy of American fishes has made such studies more feasible. Reid (1954), Kilby (1955) and Springer and Woodburn (1960) have conducted seasonality studies at latitudes 27-29° N on the Florida west coast. But the complexity of the fish faunas even that far south are dwarfed by comparison with those encountered in south Florida, latitudes 24-26° N.

The present study was conducted incidental to other investigations on south Florida fishes. To avoid presently insurmountable taxonomic problems a single close shore habitat (station) was selected and sampled for fishes. The shore fishes of the area are the group best known, but even so we are uncertain of the identifications of some of the species we report.

We extend our appreciation to Walter R. Courtenay, Jr. for allowing us to use his then unpublished keys to the young of the genus *Haemulon*.

STATION DESCRIPTION

The station chosen lies at approximately 24°51' N. and 88°44' W. on the Atlantic Ocean side of Lower Matecumbe Key. It is 2.8 miles south of the north end of the Key. The station occupies about one-tenth of a mile of shore line of a gently curving embayment of about 1.4 miles arc, and arbitrarily extends from the highest high tide level to approximately 100 yards offshore.

For about 20-40 feet below the highest high tide level the shore

¹Contribution 59.

is composed of shelly debris. Below this is a well defined band of *Diplanthera* about 10-15 feet wide. The bottom on which the *Diplanthera* grows is soft and mucky. Beds of *Thalassia* extend from the *Diplanthera* for a considerable, but undetermined, distance offshore. Patches of fine calcareous sand over a rocky bottom are interspersed among the beds of *Thalassia*. During spring low tides the *Diplanthera* beds are entirely exposed, as are portions of the near shore *Thalassia* beds. Sandy bottom occupied a greater area than grasses on the southwest portion of the station, and it was primarily in this portion that sparse attached *Sargassum* was growing. Dense *Lithothamnion*-like algae were present inshore of this portion during the first several months of the study. These algae prevented seining without extensive damage to the net. Unattached algae were not abundant during the study.

A few large sponges, *Sphaciospongia*, were scattered throughout the northeastern portion of the station, and at times snagged the seine.

The greatest depth encountered over the station was about four and one-half feet. The greatest depth encountered during the March collection was about ten inches, which was the shallowest for any collection.

After the September, 1960, hurricane the *Diplanthera* beds, but not the *Thalassia* beds, were altered. A number of plots were denuded and the bottom scooped out. Shallow sloughs were formed on either side of the *Diplanthera* band and these accumulated masses of decaying vegetation. By November the sloughs were clean.

Dates, salinities and temperatures at times of collections are listed in Table 1.

METHODS

Monthly collections were made from March, 1960, through February, 1961. A 100-foot bag seine, three-eighths inch stretched mesh, six feet deep, was used for seine collections. A pushnet (Strawn, 1954), its mesh of slightly less than a twenty-fifth of an inch in diameter, was used to supplement the seine collections.

Individual collections were continued until repeated sampling failed to elude additional species. The time required varied from two to three and one-half hours.

Pushnet and seine collections were preserved separately in approximately 10 per cent formalin. All fishes were retained with the exception of a few large specimens which were measured in the field and

the December collection of *Anchoa lamprotaenia* of which an estimated 50 per cent was retained. Undoubtedly some individuals of *A. mitchilli* and *A. cubana* were included in the discarded portion of the collection.

Specimens were sorted in the laboratory and standard lengths (unless otherwise noted) were measured to the nearest millimeter using a pair of needlepoint dividers which were stepped off on a millimeter ruler.

When in the case of certain seine collections a species was represented by a large number of specimens a random sample of 100 specimens was measured, except in the April collection when only 50 specimens of *Atherinomorus stipes* were measured. Examples of all but a few species were deposited in the laboratory collections. Distribution of the remaining material is anticipated, or else it will be discarded shortly after publication of this paper.

Surface salinities (Table 1) were taken at a distance of about 100 feet from shore. Densities of these were determined with a hydrometer, corrected for temperature and converted to salinity. Surface temperatures (Table 1) were taken at the same locations as salinity samples. These were made using a laboratory grade, mercury-filled thermometer. Fractions of a degree C were estimated.

At the present writing the following identifications are in doubt: *Bothus ocellatus* (C. R. Robins informs us that there are two species confused under this name; our specimens will be included in a study conducted by one of his students); *Jenkinsia* sp. (Robins informs us that our specimens represent an undescribed species differing from *J. lamprotaenia* in the development of a silvery lateral band among other characters); *Mycteroperca bonaci* (these are young specimens, but on the basis of fin counts and abundance of adults seem to belong here. These young have noticeable proportional differences from similar-sized specimens of *M. microlepis* from the Tampa Bay area); *Ogcocephalus cubifrons* (this is the same species reported by Springer and Woodburn, for the Tampa Bay area); *Pomacentrus leucostictus* (agrees with description by Rivas, 1960, but on the basis of west Florida material not seen by him our specimen may be *P. variabilis*); *Prionotus pectoralis* (small specimens); *Scarus croicensis* (J. E. Randall, who is studying the problem, informs us that there are two species confused under this name and means of separating small specimens are not yet known); *Sparisoma chrysopterum* (our specimens are very similar to *S. rubripinne*, but have the interradiial and nasal cirri

TABLE 1
SURFACE SALINITIES AND TEMPERATURES DURING COLLECTIONS.

	1960			1961											
	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC	JAN	FEB			
Date	1	11	9	8	11	8	6	10	7	5	9	9			
Salinity ppt.	35.1	37.9	37.9	35.6	37.9	37.8	35.9	34.7	34.5	36.3	34.6	35.8			
Temperature °C.	27.0	23.0	28.0	32.8	33.6	33.2	31.6	33.5	23.5	19.9	22.0	19.9			

TABLE 2

MONTHLY OCCURRENCE OF FISHES ON A SOUTH FLORIDA SHORE. N = NUMBER OF SPECIMENS; R = SIZE RANGE, STANDARD LENGTHS, IN MILLIMETERS; A = AVERAGE SIZE; P = PUSHNET COLLECTIONS; S = SEINE COLLECTIONS.

	1960			1961											
	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC	JAN	FEB	TOTAL		
<i>Acanthurus bahianus</i>	N			4	28-33			15	1	2			22		
	R							29-50	43	50-51					
	A			31			41	41	50	50					
<i>Acanthurus chirurgus</i>	N						8	8	1	5			14		
	R						36-52	36-52	60	23-57					
	A						41	41	37	37					
<i>Achirus inscriptus</i>	N									1			1		
	R									28					
	A														
<i>Achirus lineatus</i>	N						1			2			3		
	R						30			30-31					
	A									30					
<i>Acyrtops beryllinus</i>	N	8	25	6									45		
	R	11-19	13-20	17-19					4	2		16-19			
	A	16	18	18					17	18					

TABLE 2 (Continued)

	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC	JAN	FEB	TOTAL
<i>Albula</i>				Seen									
<i>vulpes</i>				25	1			1		1			30
<i>Allanetta</i>	2			62-83	82			82		82			62
<i>harringtonensis</i>	46			73						62			
<i>Anchoa</i>										32-49			
<i>cubana</i>										43			
<i>Anchoa</i>									11	10691			1,080
<i>lamprotaenia</i>									29-56	41-64			
<i>Anchoa</i>									47	48			
<i>mitchilli</i>									1				1
<i>Anchoa</i>									36				
<i>Anchoviella</i>													
<i>perfasciata</i>										21			21
<i>Atherinomorus</i>										63-85			
<i>stipes</i>	5	182	560	355	86	268	298			74			
	40-48	39-51	40-58	42-57	24-55	31-50	32-59			10			1,764
	43	45	49	49	39	34	42			35-45			
<i>Balistes</i>										41			
<i>capriscus</i>						1							1
						25							
<i>Barbulifer</i>	1							1					2
<i>ceuthoecus</i>	17							20					
<i>Bathygobius</i>													
<i>curacao</i>		1	1	2	2		1		1	5	2		15
		67	41	42-72	41-66		48		33	37-42	35-42		
				57	54					39	38		

(Continued)

TABLE 2 (Continued)

	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC	JAN	FEB	TOTAL
<i>Coryhoichthys</i> N				3	1	2	1	1					8
<i>brachyce-</i> R				40-85	61	29-36	59	71					
<i>phalus</i> A				56		32							
<i>Dactyloscopus</i> N		1											1
<i>tridigitatus</i> R		22											
<i>Diodon</i> A													
<i>holacanthus</i> N							1						1
<i>holacanthus</i> R							42						
<i>Doratonotus</i> A													
<i>megalepis</i> N										2			2
<i>megalepis</i> R										9-22			
<i>Echeneis</i> A										16			
<i>naucrates</i> N											1		1
<i>naucrates</i> R											154		
<i>Eucinostomus</i> A													
<i>sp</i> ³ N			4							1	1		8
<i>sp</i> ³ R			12-14							11	12		
<i>Eucinostomus</i> A			13										
<i>argenteus</i> N	17												
<i>argenteus</i> R	32-56			4	4		8	3	2	13	11		63
<i>argenteus</i> A	44			31-70	58-83		24-47	51-53	28-43	32-69	37-88		
<i>Eucinostomus</i> SN				50	73		34	52	35	43	58		
<i>Eucinostomus</i> SR		1	9	17	11	131	52	276	331	188	199		67
<i>Eucinostomus</i> SA		64	59-93	65-87	29-83	28-55	32-70	24-69	28-66	30-72	35-83		1,281
<i>Eucinostomus</i> PA			70	78	65	40	51	38	42	47	51		36-62
<i>Eucinostomus</i> PR								24	48				49
<i>Eucinostomus</i> PN								21-28	43-53	42			
<i>Eucinostomus</i> N	1	1	1	8	5	1	1	8	2	1	1		11
<i>lefyroyi</i> R	31	21	24	18-36	24-36	38	64		45		1		20
<i>lefyroyi</i> A				29	30						57		

(Continued)

TABLE 2 (Continued)

	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC	JAN	FEB	TOTAL
<i>Floridichthys carpio</i>	SN	7	6	14	68	555	534	388	29	19	11	8	1,641
	SR	39-46	35-43	38-49	14-47	16-49	25-42	17-44	26-41	29-44	32-42	37-48	2
	SA	43	40	43	26	29	32	33	33	38	43	43	44
	PA		12	14	17	16	16	18	30				
	PR		11-12	11-17	15-19	10-20	14-18	14-21	28-34				
<i>Gobiesox strumosus</i>	PN		2	10	3	29	4	3					54
	N	1											2
<i>Gobionellus boleosoma</i>	R	13		17									
	A												
	N		12	3	1	1	4	1	5	1	2	3	32
<i>Gobionellus stigmaturus</i>	R		16-33	19-29	Lost		21-33	26	24-33	21	26-27	12-28	
	A		26	25			26		29	7	26	20	
	N							7		7			14
<i>Gobiosoma robustum</i>	R							19-32		31-36			
	A							26		33			
	N							7	8		3		18
<i>Haemulon flavolineatum</i>	R							12-25	19-29	26-31	26-31		
	A							19	24	28	28		15
	N						13	2					
<i>Haemulon parrai</i>	R						31-45	30-34					
	A						35	32					
	SN				16	54	67	8	5	3	1	2	167
	SR				17-40	25-48	26-61	26-69	28-37	34-48	32	31-36	
	SA				30	36	36	40	31	41	34	34	
<i>Haemulon plumieri</i>	PA			15									
	PR			13-17									
	PN			4		26-31							7
	SN			5	73	227	46	255	38	65	57	1	767
SA	SR		27-32	26-44	25-52	28-53	28-53	28-55	27-57	29-63	28-53	37	
	SA		29	34	39	36	36	42	41	45	40		

TABLE 2 (Continued)

	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC	JAN	FEB	TOTAL
PA				26			30	42	42	42	34		
PR				26-27	34	26	23-35	40-43	31-56	35-56	26-43	44	
PN				2	1	1	6	2	13	8	3	1	37
SN					26	152	29	7		2	2	2	220
SR					24-48	23-50	27-44	42-63		26-35	20-25	22-23	
SA					36	37	34	50		30	22	22	
PA	22			23					15	12			
PR	16-28			19-27		26			13-19	9-16	26	15	
PN	2			6	1	1	1	2	3	2	1	1	16
N				2	1		53	51-54					6
R				18-76	44			52					189
A				47						168			
N					19	1	1			40-94			
R					46-57	56	55			58			
A					53								10
N									3		7		
R									214-244		193-258		
A									231		216		
N	6	3		1						1		1	12
R	9.2-17.2	15.6-16.9		10.0						8.5		14.0	
A	11.6	16.3											7
N	3	2			1	1							
R	7.4-8.0	8.4-8.9			7.4	8.6							
A	7.7	8.6											
N				3	3	1							7
R	16-21	14-18		19	15	23							
A													
N													4
R									3	1			
R									31-36	35			
A									34				

(Continued)

TABLE 2 (Continued)

	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC	JAN	FEB	TOTAL
<i>Lactophrys quadricornis</i>	N 3		2		2	1		1			2	1	12
	R 31-167		119-176		15-148	129		15			121-123	146	
	A 145		147		82						122		
<i>Lactophrys trigonus</i>	SN 2	15	29	15	13	24	14	2	5	2	2	1	124
	SR 8-11	7-215	8-26	9-33	11-200	10-40	9-265	23-26	22-25	19-20	27-119	228	
	SA 10	30	18	20	32	23	37	24	24	20	73		
	PA		12	16	20	9	14						
	PR 8-16		8-16	5-22	17-23	8-10	14-15	20	18	18		7	
	PN 2		2	3	2	2	2	1	1	1		1	15
<i>Lagodon rhomboides</i>	SN 25	20	25	20	2	12	6	7	11	20	3	5	111
	SR 26-54	43-64	26-54	43-64	66-72	73-94	78-92	62-86	67-95	33-144	87-102	87-104	
	SA 34	52	34	52	69	83	88	73	79	60	94	95	
	PA 18										12		
	PR 14-23								17		12	12	
		6						1			3	1	11
<i>Lobotes surinamensis</i>	N				2								2
	R				23-32								
	A				28								
<i>Lucania parva</i>	N							3	1			9	13
	R							22-25	26			30-32	
<i>Lutjanus analis</i>	A							24				31	63
	SN 2	12	26	2	12	26	9	2	9	3			
	SR 32-41	27-66	27-62	32-41	27-66	27-62	34-59	35-55	26-64	37-53			
	SA 32	36	49	32	36	49	48	45	41	42			
	PA 16							16	35				
	PR 16-17							16-17	25-45				
<i>Lutjanus apodus</i>	PN 2							2	2				4
	SN 3	14	3	14	97	140	99	40	8	13	4	11	430
	SR 66-68	19-71	66-68	19-71	24-93	22-68	23-65	24-124	34-51	29-56	58-106	38-52	
	SA 67	36	67	36	35	43	42	40	40	42	83	43	

TABLE 2 (Continued)

	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC	JAN	FEB	TOTAL
PA				14	25	17							
PR				14-15	17-30	15-19		48			44		11
PN				2	4	3		1			1		154
SN				4	3	34	20	60	9	14	6	4	
SR				37-78	34-47	27-116	27-60	26-67	31-65	35-77	37-55	44-61	
SA				64	41	62	40	36	45	54	43	51	
PA					14	15							
PR					13-16	14-16		26	41		45		11
PN					5	3		1	1		1		15
<i>Malacoctenus</i>				3	2	4	6						
<i>macropus</i>				12-17	16-22	16-29	17-34						2
<i>Menticirrhus</i>				14	19	22	30					1	
<i>focaliger</i>												47	
<i>Micrognathus</i>													
<i>crinigerus</i>													18
<i>Monacanthus</i>													
<i>ciliatus</i>													429
SR					5	32		1	8	5	2		
SA					24-46	24-49		56	47-75	55-68	56-67		
PA					30	34		159	58	61	62		
PR					17	29		31-63	89	119	19	6	
PN					11-27	27-34		45	36-64	22-62	42-54	34-61	
SN					5	3		45	47	50	48	48	
SR					11	19		37-50	37-50	42-50	43		
SA					10	14		19	13	14	2		56
PA					17-36	17-45		38	38	10	7	31	165
PR					29	32		21-57	24-64	18-52	15-22	16-42	
PN					27	19		38	45	39	19	22	
SN					25-33	18-20		19	45	19	19	18	
SR					28	3		19	1	13-23	5	6	
SA													
PA													
PR													
PN													

(Continued)

TABLE 2 (Continued)

	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC	JAN	FEB	TOTAL
<i>Mugil cephalus</i>									1 192				1
<i>Mugil curema</i>										4 108-126 118			4
<i>Mugil trichodon</i>										2 121-125 123			2
<i>Mycteroperca bonaci</i>										2 20-24 22			2
<i>Myrophis punctatus</i> ⁵		2 50-59 54								1 1			3
<i>Nicholsina usta</i>										2 58-86 72			3
<i>Ocyurus chrysurus</i>							1 62	2 37-52 45	1 27				3
<i>Ogcocephalus cubijirons</i>							1 185						1
<i>Opisthonema oglinum</i>								20 21-31 26		13 41-73 56			33
<i>Opsanus tau</i>		2 62-85 74				2 39-55 47	2 28-46 37	9 24-54 39	7 30-74 50	4 40-132 68	2 46-91 68	1 79	29

TABLE 2 (Continued)

	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC	JAN	FEB	TOTAL
<i>Paracrinus fasciatus</i>	N 12 R 25-36 A 30		3 32-35 33 2	18 10-34 19 1	20 10-32 19 2	18 9-35 24 2	16 17-33 25	1 29	2 32-34 33	11 9-36 26	6 12-37 24	8 15-37 21	115
<i>Paracrinus marmoratus</i>	R		12-16 14	20 21-50 36 3	2 28-41 34	2 2	2		2 38-40 39	2 37-44 40	1 41	1 44	8
<i>Paracrinus nigripinnis</i>	R			4 10-15 12	3 17-22 19	2 24-30 27					1 41	1 40	15
<i>Paralichthys albigutta</i>	A	1 223	1 50										2
<i>Pomacentrus leucostictus</i>	A					Seen			1 32				1
<i>Prionotus pectoralis?</i>	N 3 R 23-28 A 25												3
<i>Prionotus scitulus</i>	N 1 R 32												1
<i>Prionotus tribulus</i>	A										1 24	1 35	2
<i>Pristis pectinatus</i> ⁵	N										1 1440		1
<i>Pseudupeneus maculatus</i>	A					1 49	1 67						2

(Continued)

TABLE 2 (Continued)

	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC	JAN	FEB	TOTAL
<i>Sparisoma radians</i>				1 30		1 58	1 55		2 28-44	1 56			6
<i>Sparisoma rubripinne</i>					5 49-54	16 31-75	46 31-90	56 32-77	44 42-93	32 43-101	8 31-82		207
					51 36	43 46	47 33	46 46	57 47	62 38	59 39		35
			31	35-37	30-45	45-47	30-34	36-66	24-74	33-42	24-57	31-39	37
			1	2	3	3	5	5	7	4	4	3	1
<i>Sparisoma viride</i>									1 55				
<i>Sphaeroides nephelus</i>				1 44		1 24			1 48	3 68-146	2 22-44	3 42-195	22
										98	33	137	
<i>Sphaeroides spengleri</i>				3 37-54	1 56	1 31	2 24-71	2 55-82	2 48-52	2 46-68	1 61	1 20	25
				36 44			48	68	50	57			
<i>Sphyraena barracuda</i>				2 73-106	6 34-140	10 72-191	8 23-224	15 63-263	21 20-271	8 80-209	15 112-323	6 182-283	95
				28-312	87	108	132	116	128	129	253	232	
				170	90	21	15	3	3		12		
<i>Strongylura notata</i>				5 134-200	3 115-302	21 117-289	15 131-302	3 112-194	3 251-348		12		83
				82-278	195	162	169	152	304		91-357		
<i>Strongylura raphidoma</i>									4 305-414	1 407	30 365-469		39
									377		417		
<i>Strongylura timucu?</i>													2
													203

(Continued)

TABLE 2 (Continued)

	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC	JAN	FEB	TOTAL
<i>Symphurus plagiusa</i>	N		1			1				4	4	2	12
	R		36			60				42-55	26-57	21-41	
	A									48	37	31	
<i>Syngnathus dunkeri</i>	N								1				1
	R								90				
	A												
<i>Syngnathus floridae</i>	SN	1	1	3	1		3		3	2	4	2	20
	SR	181	153	145-187	144		143-182		75-188	116-157	154-203	167-169	
	SA			159			158		142	136	178	168	
	PA	67	133		119		104	109			174	65	
	PR	47-96	110-159	113	117-121	182	37-116	86-122	79-143	156	171-176	59-71	
	PN	15	3	1	2	1	8	2	4	1	2	2	41
<i>Syngnathus louisianae</i>	N	8	4	5	2	1		1				1	22
	R	52-179	59-108	165-196	114-159			89				102	
	A	116	80	178	136								
<i>Syngnathus scovelli</i>	SN	3	2	12	14	4	12	13		5	10	16	91
	SR	117-127	88-108	94-125	103-125	104-131	97-122	108-118		93-1116	102-124	96-136	
	SA	121	98	110	115	115	113	113		103	110	114	
	PA	108	110	96	81	99			68	85	88	87	
	PR	100-117	103-120	63-124	43-119	81-118	100		48-103	71-109	82-93	97	69-101
	PN	2	7	3	6	8	1		6	4	2	1	3
<i>Synodus foetens</i>	N	3	1	1	4				2				11
	R	36-40	32	80	72-102				87-131				
	A	37			83				109				

(TABLE 2 (Continued))

	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC	JAN	FEB	TOTAL
<i>Urophycis floridanus</i>												3	3
												31-50	
												38	
<i>Xyrichthys</i>				1		1							
sp.				20		11							2
Total specimens	175	286	783	683	1135	1905	1334	1111	810	2077	538	268	11,105
Total species	30	24	31	43	38	49	43	45	51	56	39	34	106

¹Approximately 50 percent of total specimens retained and counted.

²Total length. Holothurians not checked for specimens from March-November.

³Includes small unidentifiable specimens, most probably *E. gula* or *E. argenteus*.

⁴Head lengths.

⁵Total length.

⁶Includes small unidentifiable specimens, most probably *S. chrysopteryum*, *S. radians* and *S. rubripinne*.

as described by Schultz (1958) for *S. chrysopterum*; however, they lack dark saddles on the pectoral bases); *Strongylura timucu* (we are unable to distinguish this species from *S. marina*; *Xyrichthys* sp., *Sparisoma* sp. and *Eucinostomus* sp. (too small to identify). We know of no valid reason to separate *Opsanus tau* and *O. beta*. Our specimens are quite similar to those from the upper Gulf.

RESULTS

Most of our findings are embodied in Table 2. The number of specimens collected, their size range and average size are listed. In some instances pushnet collections are reported separately from seine collections to indicate size selectivity of the gear. Monthly length-frequency curves for many species were graphed, but most of these added little, or not at all to the information obtainable from the Table. A few graphs which enhance the Table are presented.

The largest numbers of species and specimens occurred during the summer and fall. The December collection was highest in both while the April collection contained the fewest species and the March collection the fewest specimens.

Approximately one third of the species, including all grunts, snappers, filefishes and parrotfishes, occurred only as young indicating that the shore area serves as a nursery ground. The grass beds for much of their distance offshore are probably also nursery grounds.

SPECIES NOTES

All specimens of *Floridichthys carpio* and almost all gobies were taken from the *Diplanthera* beds, and only during the last two months of the study were any numbers of gobies collected from the *Thalassia* beds. Except for both specimens of *Barbulifer ceuthoecus*, no goby was taken more than about fifty yards from the edge of shore.

Pushnetting over exposed *Diplanthera* educed few to no specimens of *Floridichthys carpio* or *Bathygobius curacao*. Within minutes after inundation of these beds both species were readily taken. We conclude that these forms burrow when the grass is exposed.

All flatfish and at least *Dactyloscopus tridigitatus* were taken over sandy bottom. Some specimens of *Opsanus tau* and large *Bathygobius curacao* were taken from dead *Strombus* shells. Most other species occurred over the grass beds.

In December a holothurian returned to the laboratory was cut open and a specimen of *Carapus bermudensis* was found in it. In

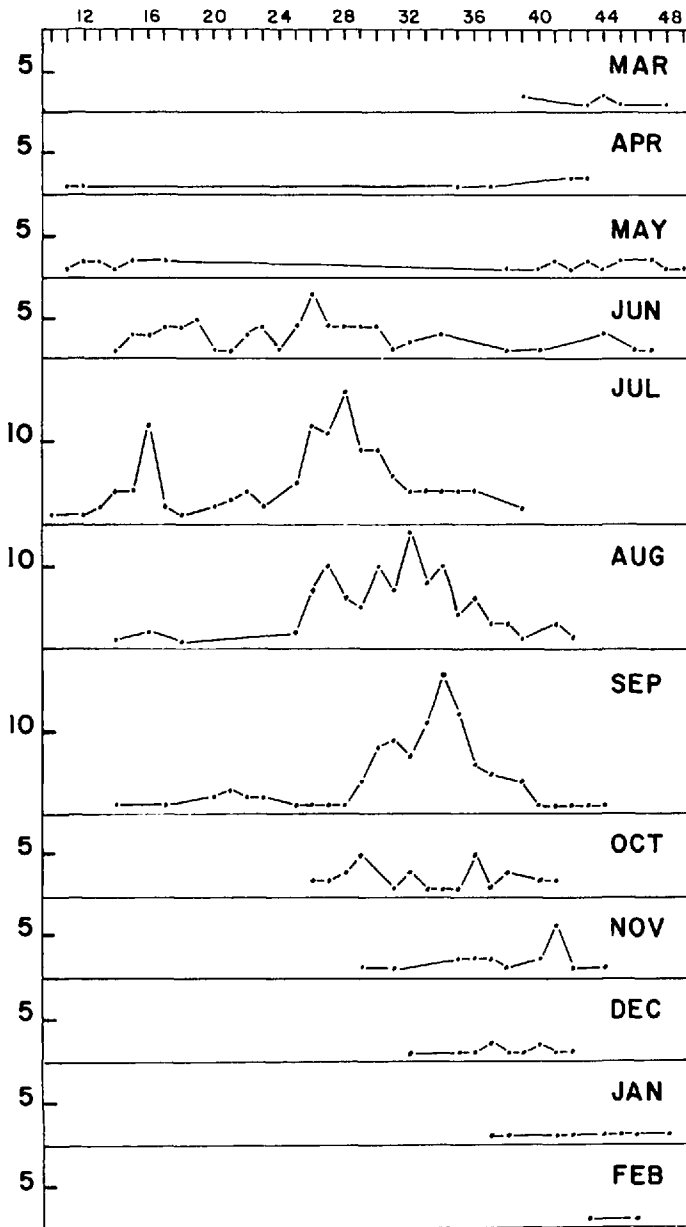


FIGURE 1. Standard length frequency distributions of *Floridichthys carpio*. Ordinate is standard length in millimeters; abscissa is frequency.

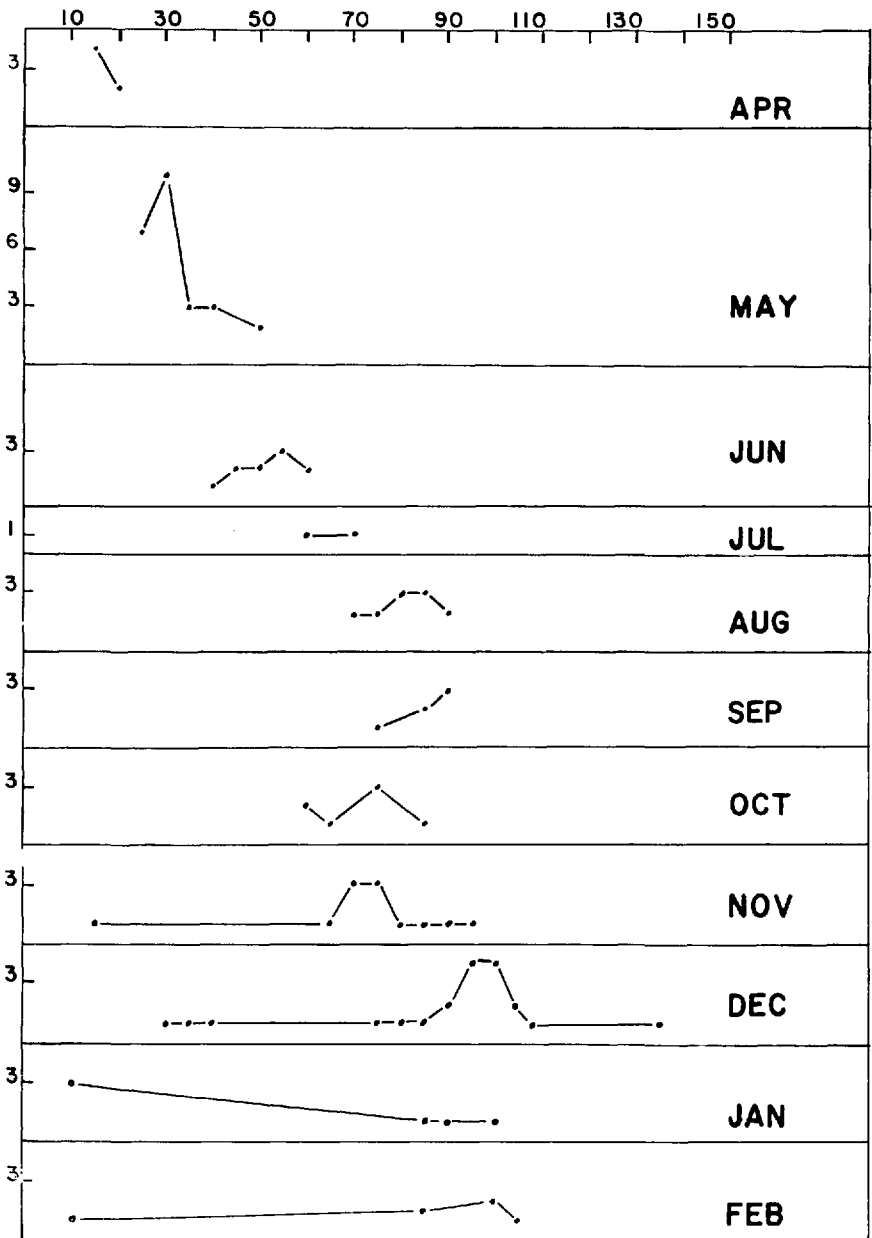


FIGURE 2. Standard length frequency distributions of *Lagodon rhomboides*. Ordinate is standard length class in millimeters (10-14, 15-19, etc.); abscissa is frequency.

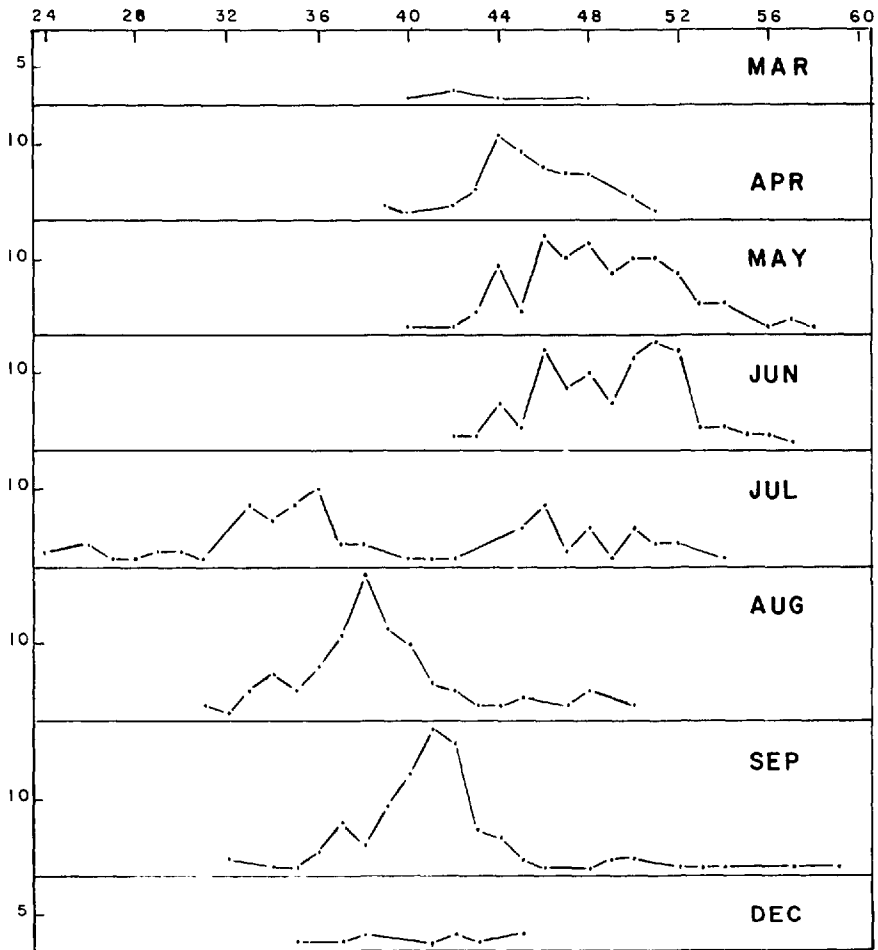


FIGURE 3. Standard length frequency distributions of *Atherinomorus stipes*. Ordinate is standard length in millimeters; abscissa is frequency.

the January and February collections we made our only efforts to obtain this species. Eight of 13 holothurians examined in January and five of seven in February each contained a single *C. bermudensis*.

Of zoogeographic interest is the fact that one-third of the species collected from this single station have never been reported from the Tampa Bay area, only three degrees latitude farther north.

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