

## Job Report

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Project Name: Analysis of Populations of Sports and Commercial Fin-Fish and  
of Factors Which Affect These Populations in the Coastal  
Bays of Texas  
Period Covered: January 1, 1962 to December 31, 1962 Job No. 14

### Survey of the Fish Found in Gulf Area 20 From 0-15 Fathoms

Abstract: This report is based on information obtained from 90 trawl samples which produced a total of over 71,000 fish, weighing over 7,400 pounds.

The fish samples in 1962 showed an increase in poundage of 90 per cent and an increase in abundance of 264 per cent over 1961. The best month for both weight and numbers was July, when there was an average of almost 200 pounds of fish per trawl.

Many fish had depth preferences, with nine fathoms being favored by most.

Objectives: To determine the fish present and their relative abundance, distribution and size.

Procedure: Regular weekly samples were taken in the Gulf of Mexico off Port Aransas, in depths of 3 to 15 fathoms. The samples were taken with a 42-foot otter trawl with 2-inch stretch mesh and 6-foot spreader doors, pulled by a 38-foot inboard boat.

Station sheets containing number of species, abundance, size, poundage and depth, were filled out for each trawl.

The data on hydrography and accompanying organisms is contained in a separate report (Project MF-R-4, Job 11) and is not presented in this report.

### Findings and

Discussion: Table 1 gives comparative information on all species taken during the year. The weight of the fish was accurately estimated, the estimation being based on known weights for known volumes.

In order to get a better picture of the contrast between the catch of 1962 and that of 1961, a comparison was made in Figure 1 between some of the more abundant fish from each year. It is a comparison of monthly abundance. Due to the close relationship of two species, Cynoscion nothus and Cynoscion arenarius, they were graphed together both years.

Figure 2 shows the monthly abundance of other fish which were common in 1962. It shows that in most cases the fish reached their greatest abundance in July.

The twelve species in Figures 1 and 2 were chosen because they were the most numerous and contributed most to the total poundage. This can readily be seen by comparing Figure 3, which represents the twelve species previously

graphed as a percentage of the total fish taken, with Figure 4, which pictures the average total poundage of scrap fish per trawl per month.

While Figures 3 and 4 are correlated to give a percentage-poundage picture for the year, there is one discrepancy. Figure 3 shows a small but definite peak in March for the percentage of fish, while Figure 4 shows no such peak in poundage at that time. This is due mainly to the presence of Stellifer lanceolatus in the March catch. Although the star drum was the most abundant fish that month, it never exceeded 90 millimeters in length. Thus, its percentage rose without greatly altering the total poundage.

One of the basic purposes of the Gulf fish research program, is to gain information on the main habitat of the fish. Figure 5 shows by average numbers of fish per trawl per fathom, that the fish have definite preferences as to depth. This is further exemplified in Figure 6 which shows the yearly average poundage of fish per trawl per fathom. It is readily seen that the fish in the shallow Gulf are not dispersed evenly over the bottom, but rather are congregated at certain depths with the 9-fathom mark being most favored.

While most of the more abundant fishes can be found at all depths, some fish definitely restrict themselves to certain areas. In Table 2, the three depth-areas studied are shown with a listing of the fish that were found in each area.

In establishing a seasonal abundance for the fish, June, July and August are considered to be warm summer months; September, October and November are the transitional fall months; December, January and February are the cold winter months; and March, April and May are the transitional spring months.

Table 3 gives the five most abundant fish per month, along with the comparative numbers. These are total numbers and are not averaged as to the number of trawls. The number of samples was regulated by weather conditions and abundance or organisms in the area.

Table 4 compares the total number of the most abundant species of fish for 1962 with the total numbers of the same fish for 1961. The fish are listed in the order of their abundance in 1962, with the order of their 1961 abundance in parentheses.

In an effort to determine spawning time for the different species of fish, the times of the smallest specimens taken were noted. These data compared favorably with the findings of Gunter (1945), who lists the fishes of the inshore Gulf which spawn during rising temperatures and those which spawn during falling temperatures.

Gunter's table is shown as Table 5 in this report.

Conclusions: The figures for 1962 would have been much more similar to those of 1961 had it not been for two trawl samples; the first taken the last of July and the second taken the first of August. The first trawl contained an estimated 12,000 fish weighing over 1,500 pounds; the second contained over 24,100 fish and weighed over 3,000 pounds. Both trawl samples were taken in nine fathoms.

This amassing of fish at nine fathoms lasted for about two weeks, soon returning to normal.

The accumulation of fish may have been due to their migratory habits or some unknown ecological condition. There is no record of the situation occurring in 1961 and only further study will reveal whether it is an annual event.

Even without the tremendous catch of the two trawls previously mentioned, the nine fathom area still proved to be the favorite of most fish. The six fathom zone was the second most frequented depth.

An overall increase in surface and bottom salinity of almost four parts per thousand was recorded during 1962 over the previous year. The overall surface and bottom temperature was lower by almost four degrees centigrade, but for the corresponding periods of greatest fish abundance, the temperatures were equal.

Whether directly or indirectly, the increase in salinity appears to have played a part in the augmentation of fish in the inshore Gulf.

Some features of Gulf Area 20 seem to be becoming more tropical each year. This is evidenced by the aforementioned increase in salinity and by the increase of certain tropical varieties of fish in the area. Most prominent of these fish are the barred grunt, Conodon nobilis, the common triggerfish, Balistes capriscus, and the dwarf goat fish, Upeneus parvus.

For the entire year of 1960 no barred grunts were found and only a few triggerfish and goat fish. This figure was increased to four triggerfish, 153 barred grunts and 320 goat fish in 1961. In 1962 the trawl brought up 167 triggerfish, 680 barred grunts and 2,198 goat fish.

Summary: For fish, 1962 was a more productive year than 1961. Sand trout, croaker and spot croaker were the most abundant fish for the year. Of the principal fish taken only the bumper, star drum and bay sand trout, showed a decline in numbers over last year. The others increased greatly, some as much as 600 per cent. Although the number of fish increased, the average size decreased.

The increase in fish numbers seems to be related to a general rise in salinity in the area. Not only did native fish become more abundant, but also fish not ordinarily numerous in the area.

The fish were found to be selective in their depth preferences, with some remaining only in very limited areas. Others, while found at many different depths, settled primarily in the 6 and 9 fathom zones.

There were definite seasonal abundances of the fish. The dominant species during the four seasons were: winter, Cynoscion arenarius; spring, Stellifer lanceolatus; summer, Cynoscion nothus; and fall, Micropogon undulatus.

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Table 1  
Fishes Taken During 1962 in Gulf Area 20

<u>Species</u>	<u>Number Collected</u>	<u>Fathoms Most Abundant</u>	<u>Size Spread in mm.</u>	<u>Periods of Smallest Specimen</u>
<u>Sphyrna zygaena</u> (Hammerhead shark)	13	11-15	40-450	April-40 mm.
<u>S. tiburo</u> (Bonnet nose shark)	6	6-15	350-900	Dec.-350 mm.
<u>Carcharhinus limbatus</u> (Black tip shark)	3	3-10	300-425	
<u>Apriondon isodon</u> (Smooth-tooth shark)	1	0-5	620	
<u>Rhinobatos lentiginosus</u> (Guitarfish)	10	3-10	150-450	April-160 mm.
<u>Marcine brasiliensis</u> (Electric ray)	29	6-10	160-460	
<u>Raja texana</u> (Clear nose skate)	19	6-15	220-750	
<u>Dasyatis sabina</u> (Stingaree)	14	3-10	140-400	
<u>Harengula pensacolatae</u> (Gulf sardine)	98	6-15	80-160	Feb.-140 mm.
<u>Brevoortia patronus</u> (Menhaden)	646	6-10	120-210	Sept.-Oct
<u>Opisthonema oglinum</u> (Thread herring)	166	6-10	90-160	Mar.-120 mm.
<u>Anchoa hepsetus</u> (Wide stripe anchovy)	896	6-15	60-140	Aug.-90 mm.
<u>Anchoa mitchilli</u> (Narrow stripe anchovy)	95	0-5, 11-15	35-110	Mar.-60 mm.
<u>Synodus foetens</u> (Inshore lizard fish)	1,319	6-15	100-400	Sept.-35 mm.
<u>Synodus poeyi</u> (Offshore lizard fish)	352	6-15	40-150	June-100 mm.
<u>Bagre marinus</u> (Gafftop catfish)	82	0-5	140-430	Dec.-40 mm.
<u>Galeichthys felis</u> (Hardhead catfish)	659	3-10	80-425	Mar.-140 mm.
<u>Mystriophis intertinctus</u> (Spoon nose snake eel)	1	11-15	400	Mar.-80 mm.
<u>Lepophidium brevibarbe</u> (Short beard cusk eel)	69	11-15	100-180	Aug.-100 mm.
<u>Otophidium welshi</u> (Welsh's cusk eel)	3		170-200	
<u>Gymnothorax nigromarginatus</u> (Black fin moray)	4	6-15	290-400	
<u>Poronotus triacanthus</u> (Butterfish)	563	6-15	60-160	Mar.-60 mm.
<u>Peprius alepidotus</u> (Harvestfish)	38	6-15	70-180	Feb.-70 mm.
<u>Urophycis floridanus</u> (Florida ling)	276	3-15	60-170	Feb.-60 mm.
<u>Centropristes philadelphicus</u> (Rock bass)	369	6-15	70-180	Jan.-70 mm.
<u>Diplectrum arcuarium</u> (Sand fish)	125	11-15	60-150	Aug.-60 mm.
<u>Lutjanus blackfordi</u> (Red snapper)	852	6-10	60-180	
<u>Lutjanus synagris</u> (Spot snapper)	7	6-10	110	Sept.
<u>Priacanthus arenatus</u> (Big-eye)	1	11-15	85	Aug.
<u>Trachurus lathamii</u> (Rough scad)	89	6-15	80-150	June-80 mm.
<u>Oligoplites saurus</u> (Leather-jacket)	2	0-5	120	

Table 1--Continued

<u>Species</u>	<u>Number Collected</u>	<u>Fathoms Most Abundant</u>	<u>Size Spread in mm.</u>	<u>Periods of Smallest Specimen</u>
<u>Selene vomer</u> (Lookdown)	9	3-10	60-130	Aug.-60 mm.
<u>Selar crumenophthalmus</u> (Goggle-eyed scad)	7	0-5	100-130	
<u>Vomer setapinnis</u> (Moonfish)	1,608	3-10	60-160	Nov.-60 mm.
<u>Trachinotus carolinus</u> (Pompano)	1	0-5	160	Sept.
<u>Caranx crysos</u> (Hard-tailed Jack)	3	0-5	230	Oct.
<u>Caranx hippos</u> (Jackfish)	13	0-5	120-190	
<u>Chloroscombrus chrysurus</u> (Bumper)	1,235	0-10	80-180	Oct. & Nov. at 80mm.
<u>Alectis ciliaris</u> (Threadfish)	4	0-10	50-60	June
<u>Stenotomus caprinus</u> (Long spine porgy)	3,921	6-15	30-120	Jan.-30 mm.
<u>Lagodon rhomboides</u> (Pinfish)	859	0-10	90-160	Aug.-90 mm.
<u>Conodon nobilis</u> (Barred Grunt)	680	0-10	40-160	
<u>Orthopristis chrysopterus</u> (Pigfish)	269	0-10	70-250	Feb.-70 mm.
<u>Eucinostomus gula</u> (Mojarra)	39	0-10	70-110	
<u>Micropogon undulatus</u> (Croaker)	16,116	0-15	90-250	June-90 mm.
<u>Leiostomus xanthurus</u> (Spot croaker)	10,361	0-10	120-180	June-120 mm.
<u>Larimus fasciatus</u> (Banded croaker)	940	0-10	40-160	Feb.-40 mm.
<u>Stellifer lanceolatus</u> (Star drum)	819	0-10	40-130	Mar.-40 mm.
<u>Pogonias cromis</u> (Black drum)	2	0-5, 11-15	450, 600	
<u>Cynoscion nothus</u> (Gulf sand trout)	14,958	0-15	40-200	Jan.-40 mm.
<u>Cynoscion arenarius</u> (Bay sand trout)	437	0-15	70-260	Feb.-70 mm.
<u>Menticirrhus americanus</u> (Southern kingfish)	20	0-10	100-250	
<u>Menticirrhus littoralis</u> (Whiting)	1,594	6-10	120-145	
<u>Menticirrhus saxatilis</u> (Northern kingfish)	2	6-10	110, 220	Sept.
<u>Bairdiella chrysurus</u> (Yellow tail)	4	6-10	200	
<u>Upeneus parvus</u> (Dwarf goat fish)	2,198	6-15	80-150	June-80 mm.
<u>Chaetodipterus faber</u> (Spade fish)	100	6-10	40-130	Jan.-40 mm.
<u>Trichiurus lepturus</u> (Ribbon fish)	5,475	6-10	100-450	
<u>Scomberomorus maculatus</u> (Spanish mackerel)	6	0-5	210-340	
<u>Scomberomorus cavalla</u> (King mackerel)	13	11-15	120-210	
<u>Scorpaena calcarata</u> (Red scorpion fish)	1	6-10	40	
<u>Prionotus rubio</u> (Red sea robin)	213	6-15	75-180	June-75 mm.
<u>Prionotus stearnsi</u> (Short wing sea robin)	3	11-15	95	
<u>Prionotus tribulus</u> (Southern sea robin)	37	6-15	50-210	Feb.-50 mm.
<u>Prionotus paralatus</u> (Spiny sea robin)	13	0-5	70-90	
<u>Sphyaena guachancho</u> (Texas barracuda)	4	6-15	90-400	
<u>Hippocampus hudsonius</u> (Sea horse)	25	6-10	90-100	
<u>Syngnathus louisianae</u> (Louisiana pipefish)	3	6-15	120-180	

Table 1--Continued

<u>Species</u>	<u>Number Collected</u>	<u>Fathoms Most Abundant</u>	<u>Size Spread in mm.</u>	<u>Periods of Smallest Specimen</u>
<u>Polydactylus octonemus</u> (Threadfin)	305	6-10	90-210	
<u>Syacium gunteri</u> (Common Gulf whiff)	1,420	6-15	70-150	Mar.-70 mm.
<u>Citharichthys spilopterus</u> (Spot fin whiff)	5	6-10	90	Aug.
<u>Cyclopsetta chittendeni</u> (Mexican flounder)	1	11-15	70	Sept.
<u>Citharichthys macrops</u> (Large-eyed whiff)	99	11-15	110-130	
<u>Ancylopsetta quadrocellata</u> (Ocellated fluke)	72	6-15	60-400	
<u>Ancylopsetta dilecta</u> (Three spot flounder)	5	0-10	220	
<u>Paralichthys lethostigma</u> (Southern flounder)	28	0-15	110-300	
<u>Trinectes maculatus</u> (Hog choker)	49	0-10	50-90	Aug.-50 mm.
<u>Gymnachirus texae</u> (Naked hog choker)	2	6-15	70, 180	
<u>Symphurus plaguosa</u> (Tongue sole)	68	6-15	90-130	
<u>Balistes capriscus</u> (Common triggerfish)	167	0-10	100-190	
<u>Monacanthus hispidus</u> (Common filefish)	21	0-10	70-120	Mar.-70 mm.
<u>Alutera scripta</u> (Scrawled filefish)	16	0-10	110-250	June-110 mm.
<u>Lagocephalus laevigatus</u> (Rabbit fish)	216	6-15	70-240	June-70 mm.
<u>Sphaeroides nephelus</u> (Puffer)	22	11-15	40-160	Mar.-40 mm.
<u>Chilomycterus schoepfi</u> (Spiny boxfish)	6	0-10	130-190	
<u>Astroscopus y-graecum</u> (Spineless stargazer)	1	0-5	180	
<u>Kathetostoma albigutta</u> (Spined stargazer)	1	6-10	140	Sept.
<u>Porichthys porosissimus</u> (Midshipman)	12	11-15	70-100	Aug.-70 mm.
<u>Ogecephalus nasutus</u> (Long nose bat-fish)	9	6-15	60-250	
<u>Halieutichthys aculeatus</u> (Round bat-fish)	1	11-15	40	Jan.

Table 2

## Depth Restrictions of Certain Fish

Fathoms	Fish Restricted to This Depth
0-5	<i>Bagre marinus</i> <i>Selar crumenophthalmus</i>
6-10	<i>Narcine brasiliensis</i> <i>Brevoortia patronus</i> <i>Opisthonema oglinum</i> <i>Lutjanus blackfordi</i> <i>Menticirrhus littoralis</i> <i>Menticirrhus saxatilis</i> <i>Chaetodipterus faber</i> <i>Trichiurus lepturus</i> <i>Hippocampus hudsonius</i> <i>Polydactylus octonemus</i>
11-15	<i>Sphyrna zygaena</i> <i>Diplectrum arcuarium</i> <i>Priacanthus arenatus</i> <i>Scomberomorus cavalla</i> <i>Sphaeroides nephelus</i> <i>Porichthys porosissimus</i>



Table 3  
Monthly Abundance of Fish

Five most abundant fish for each month are listed,  
with the total numbers in parentheses

January	February	
C. nothus (55)	U. floridanus (50)	
C. arenarius (45)	C. arenarius (30)	
C. philadelphicus (35)	A. mitchilli (30)	
S. gunteri (35)	T. lepturus (30)	
S. foetens (20)	M. littoralis (20)	
March	April	May
S. lanceolatus (703)	M. littoralis (150)	No data
G. felis (505)	U. floridanus (40)	
C. nothus (430)	O. oglinum (40)	
P. triacanthus (130)	C. nothus (30)	
S. gunteri (120)	A. hepsetus (25)	
June	July	August
C. nothus (853)	C. nothus (6,138)	M. undulatus (10,129)
C. chrysurus (421)	M. undulatus (4,900)	C. nothus (7,099)
T. lepturus (338)	L. xanthurus (4,020)	L. xanthurus (5,994)
S. gunteri (47)	T. lepturus (1,029)	S. caprinus (3,170)
L. laevigatus (25)	S. caprinus (604)	U. parvus (2,087)
September	October	November
M. undulatus (745)	M. undulatus (230)	C. chrysurus (505)
C. nothus (293)	C. chrysurus (88)	V. setapinnis (93)
L. xanthurus (148)	S. caprinus (75)	L. xanthurus (58)
L. rhomboides (130)	B. marinus (35)	M. undulatus (50)
H. pensacolae (90)	C. arenarius (25)	S. gunteri (20)
December		
C. macrops (86)		
S. foetens (49)		
V. setapinnis (40)		
C. arenarius (24)		
M. littoralis (22)		

Table 4

## Abundance Comparison of the Most Abundant Fish in 1961 and 1962

The fish are listed in the order of their abundance during 1962, with their 1961 order of abundance in parentheses.

Species	Number	
	1962	1961
M. undulatus	16,116	2,381 (2)
C. nothus	14,958	1,422 (3)
L. xanthurus	10,361	697 (6)
T. lepturus	5,475	578 (7)
S. caprinus	3,921	482 (8)
U. parvus	2,198	320 (9)
V. setapinnis	1,608	285 (10)
C. chrysurus	1,235	3,444 (1)
L. fasciatus	940	165 (11)
L. rhomboides	859	104 (14)
L. blackfordi	852	115 (13)
S. lanceolatus	819	1,036 (4)
C. nobilis	680	153 (12)
C. arenarius	437	766 (5)
B. capriscus	167	4 (15)

Table 5\*

## Times of Fish Spawning

Lists are given of the fishes that spawned when the water temperature was rising or high and those that spawned when it was falling or low. The time of appearance of the young, as given in the text, was used as an indication of the time of spawning in cases where ripening gonad were not noted.

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Fishes that breed at the time of rising or high temperatures.

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Isogomphodon limbatus	Caranx hippos
Harengula macropthalma	Chloroscombrus chrysurus
Brevoortia sp.	Trichinotus carolinus
Brevoortia tyrannus	Pomatomus saltatrix
Anchoa hepsetus	Lobotes surinamensis
Anchoa mitchilli diaphana	Orthopristes chrysopterus
Bagre marina	Larimus fasciatus
Galeichthys felis	Bairdiella chrysurus
Synodus foetens	Stellifer lanceolatus
Lucania parva venusia	Menticirrhus americanus
Fundulus grandis	Menticirrhus littoralis
Fundulus similis	Pogonias cromis
Cyprinodon variegatus variegatus	Cynoscion arenarius
Syngnathus scovelli	Cynoscion nebulosus
Menidia beryllina peninsulae	Cynoscion nothus
Membras vagrans vagrans	Prionotus tribulus
Mugil curema	Sphoeroides marmoratus
Polydactylus octonemus	Citharichthys spilopterus
Trichiurus lepturus	Achirus lineatus
Poronotus triacanthus	

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Fishes that breed at the time of falling or low temperatures.

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Lepisosteus spathula	Leiostomus xanthurus
Adidia multifasciata	Micropogon undulatus
Mugil cephalus	Paralichthys lethostigma
Lagodon rhomboides	Symphurus plaguista
Sciaenops ocellata	

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\* Gunter, 1945

Figure 1  
Abundance of Common Fish Sampled-1961 and 1962

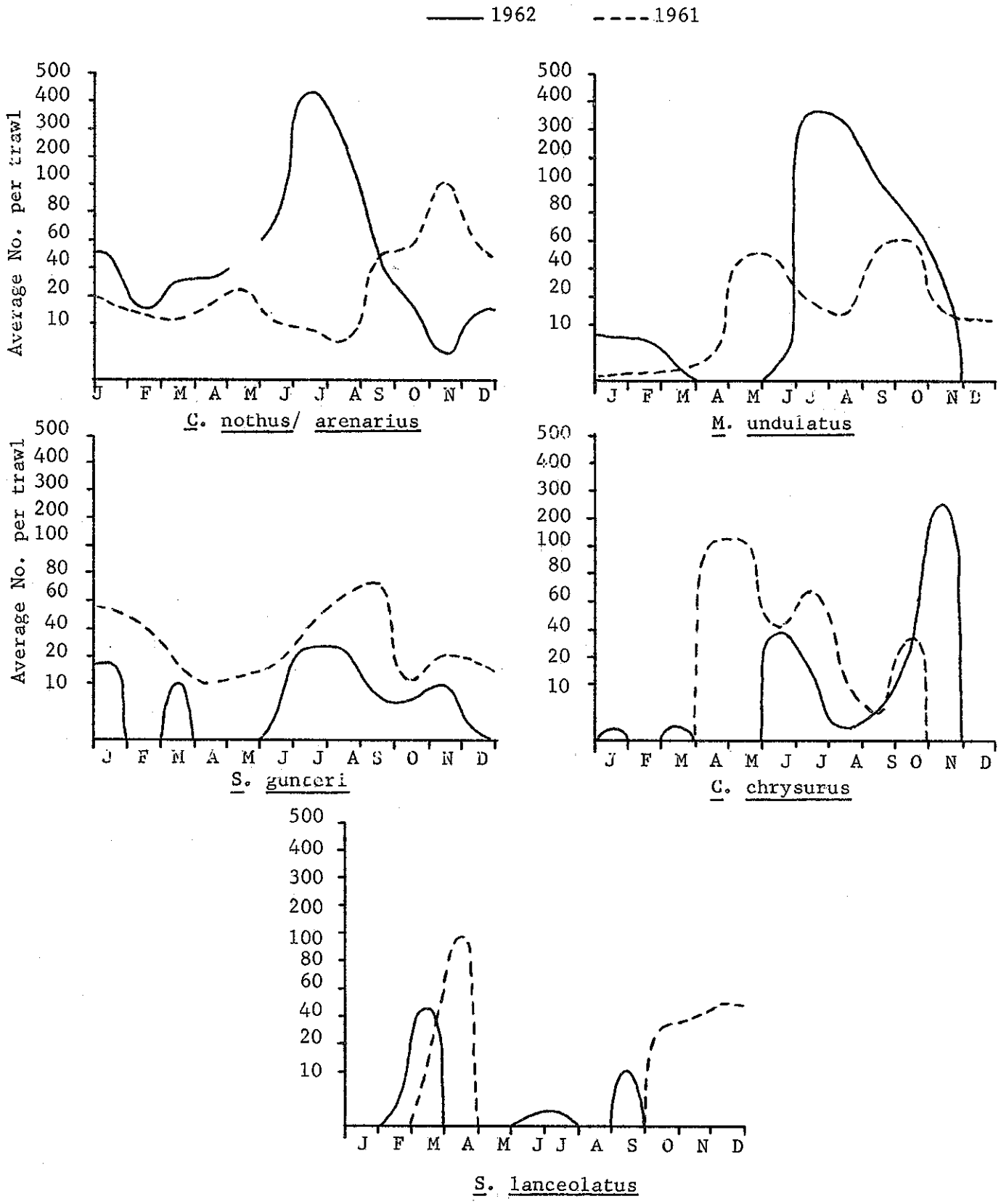


Figure 2  
Abundance of Common Fish Sampled-1962

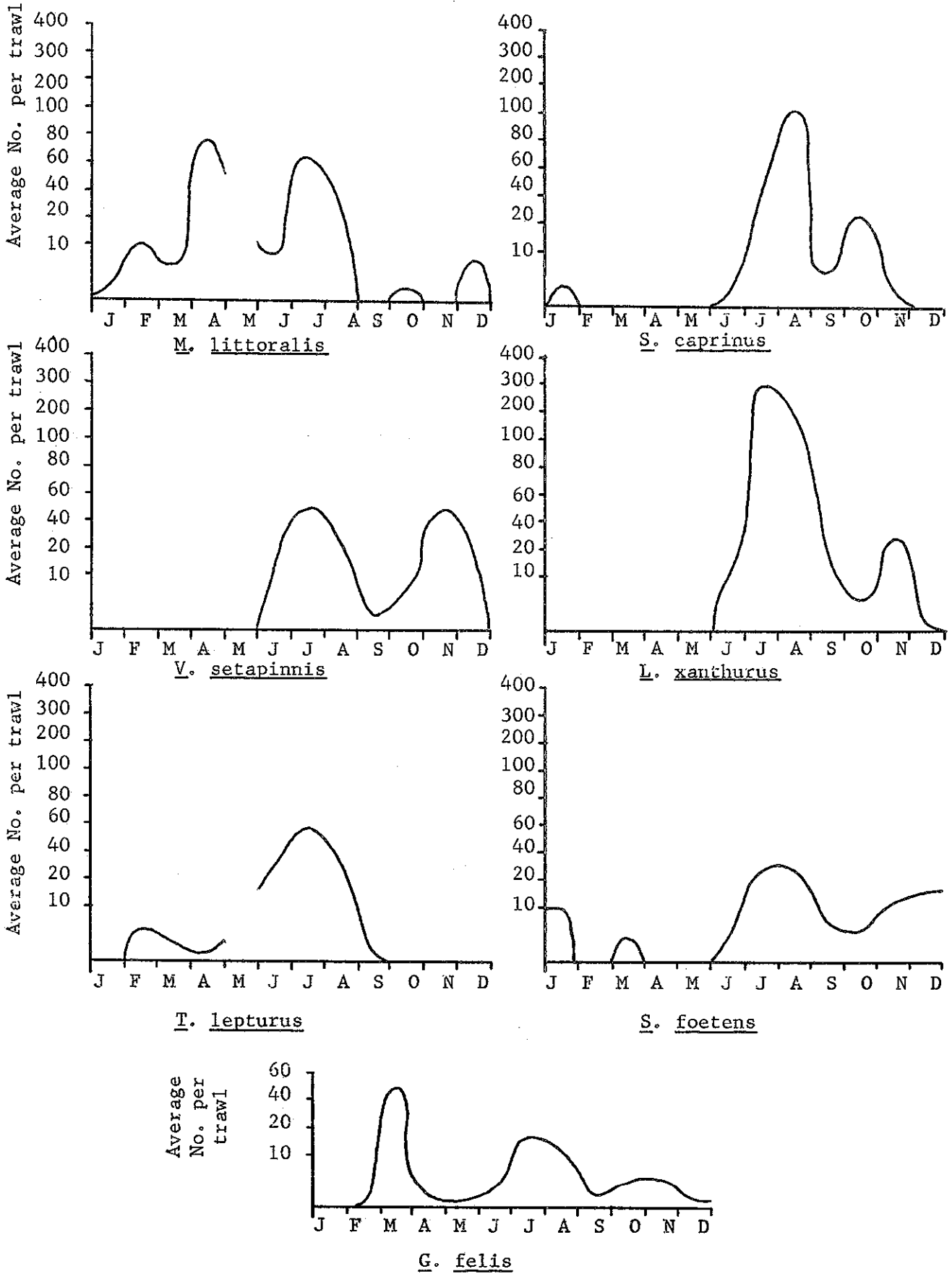


Figure 3  
Monthly Composite of Major Species as  
a Percentage of the Total Species

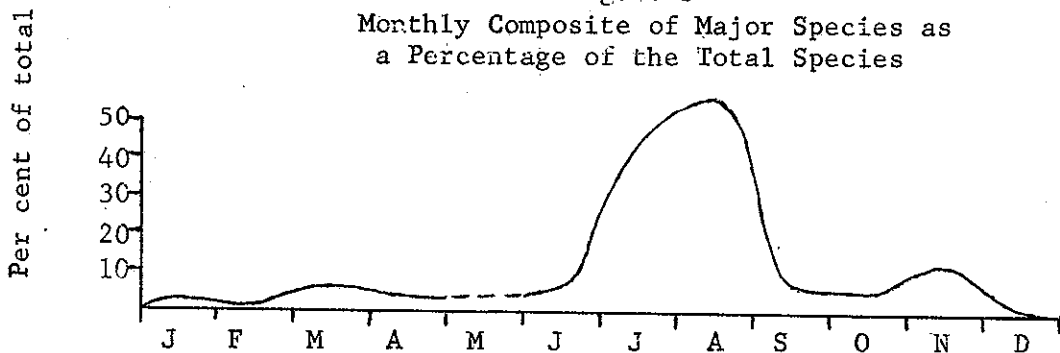


Figure 4  
Average Total Poundage of Fish Per Trawl

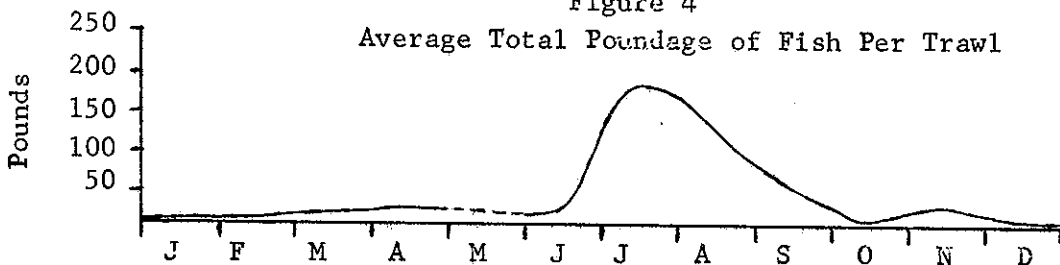


Figure 5  
Average Number of Fish Per Trawl by Depth

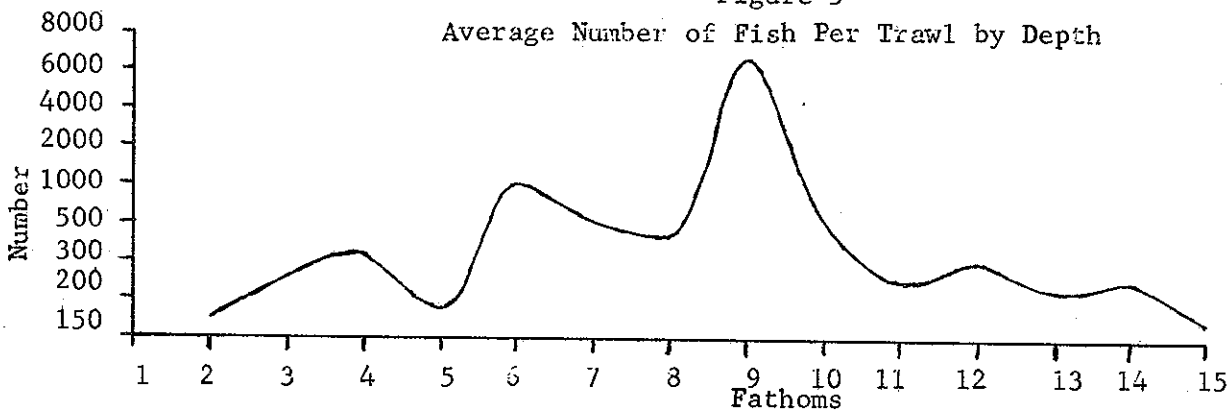


Figure 6  
Average Pounds of Fish Per Trawl by Depth

