Demersal Fish Resources Around Qatar

by

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ABSTRACT

The study was based on the data available from Fishery Resources Survey in the Gulf and Gulf of Oman, conducted by F.A.O., between 1975 and 1979 and the samplings of the fish production in Qatar during 1980/81. The survey was conducted with standard type Engel high opening trawl, having a 32mm mesh codend, and the sampling stations were randomly selected.

About 150 demersal species belonging to about 50 families were identified from the survey and the fishery catches.

The density distributions for important fish families were based on the swept area method, and the biomass of demersal species was estimated to be about 86,500 m/tons of commercially valuable species and 11,300 m/tons of non-commercial species, within the Qatar Waters of 35,000 km_2.

The yield of demersal species from existing fisheries within the area, was estimated to be 2,900 m/tons. The maximum potential yield of the exploited stocks was estimated to be 22,000 m/tons of commercially valuable species and 3,000 m/tons of non-commercial species.

Introduction

Fish production in Qatar has been at an almost steady level during the past few years, as a result of insignificant changes in the fishing effort. On the other hand, the fishing effort on shrimps around Qatar and her neighbouring states such as Saudi Arabia, Bahrain and Kuwait, increased significantly and rapidly over the last decade and the resulting decline in catch rates and annual production forced the recent closure of the shrimp fishing companies in Qatar and Bahrain. The fin-fish fishery in Qatar is predominantly a demersal fishery. The State of Bahrain has also been actively conducting demersal fishery in the off-shore range on the eastern side of Qatar, but it is understood, that Bahrain's fishing effort in this area is declining at present. At the same time, there is a growing interest in increasing the demersal fish production by Qatar, and two of the original shrimp trawlers have been modified to carry out bottom trawling for finfish as well.

In view of the above factors, it was considered necessary to evaluate the general status of demersal fish stocks around Qatar to ensure rational exploitation and utilization of the available resources. The Regional Fishery Survey and Development Project, sponsored by the United Nations Development Programme and executed by the Food and Agriculture Organisation, conducted a survey and estimated the potential resources of finfish in the Gulf and Gulf of Oman; it could not venture to estimate the fish resources around individual states, because national boundaries in the Gulf are yet to be officially declared.

Though a specially designed survey for this specific purpose would provide more complete information on the fish resources around Qatar, it is not possible to undertake such an exercise right now and, therefore, some estimates of the fish resources around Qatar and the present yield level are required for planning fishery development and management during the interim period. The objective of this report is to meet these requirements in respect of the demersal fish resources around Qatar.

Acknowledgements

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provided invaluable assistance, by giving the catch figures for the vessel 'Gazelle'. We are also grateful to Mrs. Saad for typewriting the script.

Data and Analysis

The data for analysing the catch composition of existing fisheries in Qatar, fishing effort through various methods or gears, catch rates, seasonal variation and annual production, were collected by systematic sampling of the landings at various fishing centres in Qatar from February 1980 to Frbruary 1981. The data, collected by the Regional Fishery Survey and Development Project (between 1977 and 1979), included bottom trawl sampling (of standard type) at randomly selected stations for the whole Gulf. The data, relevant to the present study, were extracted after identifying the off-shore boundaries for Qatar. The boundaries declared by the Ministry of Finance and Petroleum, Qatar (Anonymous 1977), for the exclusive exploitation of oil and gas, was applied in the present study and the body of water, enclosed by these boundaries, is referred to as 'Qatar waters' (Fig. 1).

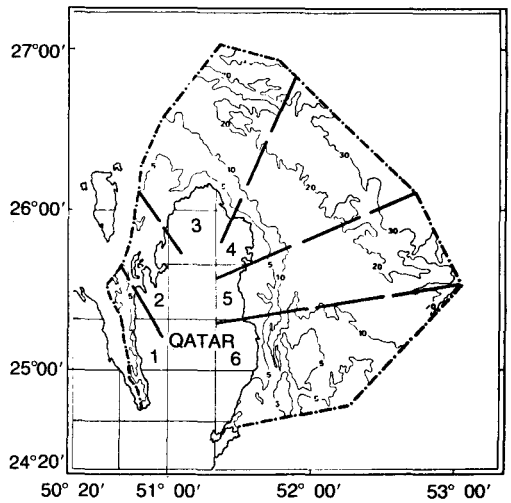

Fig. 1: The boundaries for Qatar waters (based on Anonymous, 1977), the depth contours (based on Purser, 1973) and the stratification into Areas and Sub-areas.

Approximately 120 sampling stations were selected within the Qatar waters, but only 98 stations were successfully sampled, because others were either in caution areas around oil rigs, or in inaccessible areas and untrawlable bottom. As the stations were randomly distributed and the number of stations proportional to the area of strata, for the present study, it was assumed that the distribution of stations, within the Qatar waters, also followed the same pattern and that the sampling would not introduce significant bias to the present analysis of the catch composition and mean density values. These stations were covered from January to November, but mainly between March and October. The information obtained, included catch by species or species groups, duration of tow, towing speed. The standard trawl used was an Engel's high opening net with 32mm mesh size at the cod-end, towed at a speed of 3 knots for one hour and the opening between wing-tips was estimated as 20 metres.

Environmental factors have significant influence on the occurrence, abundance and seasonal movements of fish, but available data are insufficient to attempt such correlations conclusively. However, the bottom contour and bottom sediments in the area, as described by Purser (1973), was used to consider possible influence of bottom conditions and depth factor on density distribution and species composition (Fig. 2).

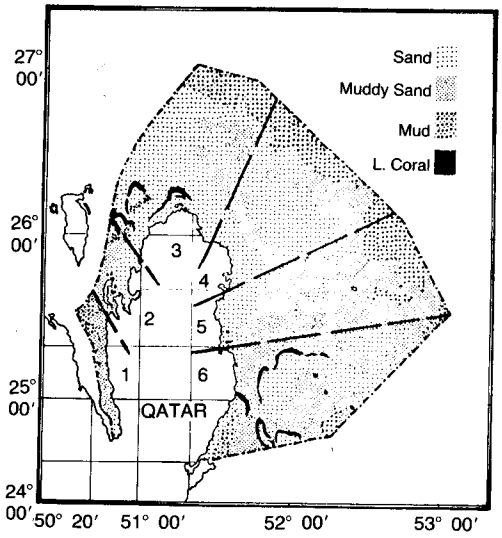

Fig. 2: Distribution of the basic types of bottom, in Qatar waters (Bassed on Purser, 1973).

Supporting evidence on catch rates were also obtained from the 'indicative fishing', carried out by the project vessels and commercial trawling vessels from Qatar, Bahrain and Kuwait, between January and March 1979.

Enlarged maps of the bottom contours and bottom conditions of the Qatar waters were prepared, based on Purses (1973) and the off-shore boundaries, declared by the State of Qatar (Ananymous, 1977). It was then divided into six Areas, the positions and numbers of Areas being determined by :

a) coastline contour of the state,
b) gradient of the bottom from shore to off-shore boundaries,
c) distribution pattern of the bottom conditions and
d) distribution of fishing centres around Qatar (Fig. 2).

Area 1: South-east of Qatar and extending midway between Qatar and Saudi Arabia. Relatively shallow and narrow belt with the line from 25° 32'N, 50° 46'E to 25° 43'N, 50° 39'E as the northern limit.

Area 2: West of Qatar and eastern half of the very shallow body of water between Qatar and Bahrain. Above Area 1 and extending up to the line between 25° 54'N, 50° 59'E and 26° 10'N, 50° 46'E.

Area 3: North of Qatar and Between lines drawn from 25° 54'N, 50° 59'E to 26° 10'N, 50° 46'E and 25° 57'N, 51° 31'E to 26° 46'N, 51° 49'E.

Area 4: North-east of Qatar and east of Area 3. Southern boundary line is from 25° 41'N, 51° 31'E to 26° 04'N, 52° 41'E.

Area 5: East of Qatar, south of Area 4 and north of the line from 25° 20'N, 51° 30'E to 25° 31'N, 53° 03'E, which separates it from Area 6.

Area 6: South-east of Qatar and predominantly shallow area, south of Area 5.

The isobath lines were used to subdivide each Area into Sub-Areas as follows :

A = 0 — 5 Fathoms
B = 5 — 10 Fathoms
C = 10 — 20 Fathoms
D = 20 — 30 Fathoms
E = more than 30 Fathoms

The Fathom scale had to be adopted to superimpose the stratified area map over that of the bottom types, according to Purser (1973).

Because of the varying distances of the boundary lines from the shoreline around Qatar and the differences in the gradient of the bottom in the six Areas, the surface area of different Sub-Areas in each Area or Sub-Areas of similar depth range in different Areas, vary. The surface area was measured with a planimetre (Table 1).

The trawl survey stations falling within the Qatar waters were plotted on Fig. (1) and the relevant data from these stations were tabulated, according to Area, Sub-Area, season and bottom conditions (using Fig. 2 also). Many of the untrawlable stations were in Area 6, which is relatively very shallow and with poor accessibility for the survey vessels. No trawl survey stations were allocated in the 0 - 5 Fm depth, being too shallow for the surveys vessels.

The mean catch rates were estimated as the average weight in kilogrammes, caught per hour of towing time. Such values were calculated for :

— total catch,
— catch of all commercially valuable species,
— non-commercial species and major species groups,
— according to Sub-Areas.

The area swept by the trawl was estimated as 0.11 Km^2/hr and, applying the swept area method, the mean density was determined by converting the catch from the area swept into a catch per square kilometre (kg/km^2). The mean density values were raised to the area of corresponding Sub-Areas to provide the estimate of biomass. There is hardly any information on the age and growth of fishes in the Gulf, but, considering the fact that many of the demersal species seem to have a very moderate life span, while only a few have a span of ten years or more, it is acceptable to apply an instantaneous natural mortality rate (M) of 0.5 (Gulland, 1971). Since the demersal stocks in the Qatar waters are being exploited, but the level of production (as estimated from the sampling conducted throughout 1980) indicates that the stocks are not heavily exploited, the maximum potential yield (PY_{max}) has been estimated as $PY_{max}=ZB/2$ (Clark, 1978), where Z is the instantaneous total mortality obtained by using M=0.5 and F estimated from the production and biomass values; B is the exploited stock biomass.

After the completion of the preliminary calculations, it was observed that the catch rates in each Area apeared to be correlated to the distance from the shore-line to a certain depth range. Hence, regression analysis was attempted for Areas 3, 4 and 5, which have steadily increasing depths with increasing distances from shore up to the depth range, where the catch rate reaches a maximum.

Assuming that the catch rates would continue to decline towards the shore, until it reaches a zero value at the edge of the water, mean catch rates were obtained by extrapolating the curve to the mean distance of the Sub-Area without valid sampling, from the shore-line. Further evidence of the resources in this very shallow Sub-Areas around Qatar was obtained through sampling of the fish caught by the inshore fishery.

Environmental Conditions in the Qatar Waters

The estimated surface area of the Qatar waters is approximately 35,000km^2, which is approximately 15 % of the total area of the Gulf. Depth are as follows :

0 — 5 Fm:	Nearly 17
5 — 10 Fm:	18
10 — 20 Fm:	43
20 — 30 Fm:	17
more than 30 Fm:	5

Areas 1, 2 and 6 are almost entirely less than 10Fm in depth, while other Areas show a fairly even distribution of depth zones up to 30 Fm (Table 1). The sea bottom may be sandy, muddy, coral-line or a mixture of these. Sandy bottom spreads over about 45 % of the sea floor within Qatar waters and approximately the same extent is covered by a mixture of mud and sand; only about 10 % is covered by corals.

Table 1

Estimated area of the strata, number of stations, effectively sampled and predominant types of bottom within each stratum.

DEPTH RANGE	*ITEMS*	*Area 1 S. W. Coast*	*Area 2 W. Coast*	*Area 3 North*	*Area 4 N.E. Coast*	*Area 5 E. Coast*	*Area 6 S. E. Coast*	*Total*
0 — 5 Fm (A)	Area (km^2)	254	1'329	1,349	200	963	1,904	5,999
	Stations sampled	0	0	0	0	0	0	0
	Pred. bottom	sand	sand	c. sand	sand	sand	sand	
5 — 10 Fm (B)	Area (km^2)	643		1,189	334	537	3,853	6,624
	Stations sampled	1	0	4	0	0	1	6
	Pred. type bottom	muddy sand	muddy sand	sand	sand	sand	c. sand	
10 — 20 Fm (C)	Area (km^2)	183	0	2,544	2,821	4,210	5,434	15,192
	Stations sampled	2	0	12	13	20	3	50
	Pred. type bottom	muddy		sand	sand	muddy sand	muddy	
20 — 30 Fm (D)	Area (km^2)	0	0	1,035	3,176	1,610	183	6,004
	Stations sampled	0	0	5	20	6	0	31
	Pred. type bottom			muddy sand	sand	muddy sand	muddy	
30 — 40 Fm (E)	Area (km^2)	0	0	260	666	597	0	1,523
	Stations sampled	0	0	5	2	4	0	11
	Pred. type bottom			mud	muddy sand	muddy		
TOTAL	Area (km^2)	1,080	1,397	6,377	7,197	7,917	11,374	35,342
TOTAL	Stations sampled	3	0	26	35	30	4	98

Area 1	is predominantly muddy sand and mud,
Area 2 and 4	are predominantly sandy,
Area 2	is equally covered by muddy-sand and sandy bottom,
Area 5	is predominantly muddy-sand but the shallow part is sandy and the deepest part is muddy
Areas 3 and 6	have concentrated coral patches in shallow waters (Fig. 2).

Large extents of the bottom in Areas 1, 3, 4 and 5 are trawlable, but Area 6 and distal part of Area 5 have been found to be relatively rough for trawling without bobbins on foot-rope.

The surface temperature within the area may range from a low mean of 16°C to a high mean of 34°C between January and August. At the deeper end of the Qatar waters the bottom temperature varies within a narrow range of about 18° - 22°C, which results in an almost vertical isotherm in winter and a very clearly defined thermocline in the summer months. In the inshore waters, the variation follows the same pattern as in the off-shore range, but with slightly mean temperatures in the summer and relatively lower mean temperatures in the winter (Jackson, 1980). Inside lagoons, the temperature could vary from 40° to 15° (Dubach 1979). Salinity within Qatar waters tends to be high and generally varies between 39°/∞ at the surface and it is slightly greater at the bottom. Salinity of over 60°/∞ have been recorded in the Khor al Odeid (Anonymous 1979; Purser 1973). Precipitation within the area is negligible and the hihest rainfall recorded in 1979 was 34mm/24hrs in March (Jackson 1979). Wave height and wave distance appear to be small. 'Shamal' or north-west winds are prevailant and are stronger in winter than in summer. Due to the shallowness of the water, 'Shamal' with a force of over 4 Beaufort causes turbidity in the shallow waters around Qatar.

Primary productivity studies conducted at a preliminary level in the lagoon at Al Khor, indicated a low range of 0.690 - 1.881 $mgC/m^3/h$ (Ibrahim 1980) and the plankton biomass estimated for the Qatar waters was 500 - 1'000 mg/m^3, 200 - 500 mg/m^3 and 150 - 200 mg/m^3 for the northern, eastern and south-eastern waters around Qatar respectively (Al Kholy and Soloviov, 1978).

Prevalence of pollutants in the Qatar waters is strongly indicated by frequent occurrence of oil globules in the water, tar-balls on the beach and dead birds, sea-snakes, turtles and fishes washed ashore.

Results and Discussion

Species composition :

About 150 species of fishes, belonging to nearly 50 families, have been identified in the catches by various fishing methods used in Qatar, as well as from the sampling conducted during the survey. Only 110 bony fishspecies and 7 cartilaginous fishes were found to be typically demersal. It is also evident, that there are other families and species of fishes in Qatar waters, but these are either in niches, which makes them less vulnerable to the gears used for the survey and fishing, or they are extremely rare. The number of species appearing in a single bottom trawl haul in Qatar waters, averaged 23, but varied between 9 and 45. The tendency for higher number of species in a haul is more frequent in the 10 - 20 and the 20 - 30 Fm depth ranges than in shallower or deeper waters. Though about 23 species or species groups appear in a haul, little less than 50 % of them contribute more than 2 % of the total catch and only about 5 families contribute more than 5 % to the percentage species composition for any one of the Sub-Areas (Table 2). The predominant families are :

— Carangidae
— Lethrinidae
— Lutjanidae
— Pomadasyidae
— Mullidae

The order of predominance changes with Area and Sub-Area. Significant changes in the percentage species composition occurs with changes in depth zones.

Of the 117 species of truly demersal species in Qatar waters, 66 are presently valued as commercially marketable species, 12 are marketable in limited quantities and the remaining 39 species are unmarketable or trash fish. Some of the unmarketable species may be marketable in other parts of the world. Besides the species factor, the size factor also determines the commercial value of a fish in Qatar. Generally, fishes less than 12cm in total length are considered unmarketable and, therefore, yound and juveniles of larger and popular varieties, such as :

— Lethrinidae
— Sphyraenidae
— Nemipteridae
— Lutjanidae
— Mullidae
— Pomadasyidae
— Sparidae
— Synodontidae

are also discarded at sea as trash fish. However, in the present study, non-commercial-species-catch refers only to the species, which are unmarketable irrespective of their size factor. It does not include the juveniles and immature fishes of commercial species.

In the species composition, commercial species were between 80 and 90 % of the total for the Areas on the eastern side of Qatar, but they tend to decline to about 70 % in the Areas 3 and to less than 50 % in Area 1. Areas 3 and 6 enclose dense coral patches, which favour proliferation of coral fishes, which are non-commercial. The unique composition pattern in the south-western corner (Area 1) may have been influenced by the fact, that it is semi-isolated from the main body of the Gulf water and the stress and strain of the environmental conditions may have significant influence on the animal community within this Area (Table 2).

Table 2
Percentage species composition, according to 'Area' and depth strata around Qatar.

Families	Area 1		Area 3				Area 4			Area 5			Area 6	
	Strata B	Strata C	Strata B	Strata C	Strata D	Strata E	Strata C	Strata D	Strata E	Strata C	Strata D	Strata E	Strata B	Strata C
Carangidae	16.1**	4.5**	17.3***	16.3***	42.9***	8.8	29.7***	27.0***	6.2	16.8***	4.5	24.3***	41.1***	24.0***
Gerreidae	6.7	3.6	2.5	3.5	3.3	—	0.2	0.1	—	0.9	3.3	—	1.4	1.6
Lethrinidae	0.9	2.2	6.2	13.6	5.0	—	9.4*	5.3	0.7	9.6*	12.3*	1.3	—	7.3
Lutjanidae	—	—	7.9**	10.8*	14.8**	4.6*	1.0	9.8	12.4*	5.1	12.5**	7.9	—	8.0
Mullidae	2.7	0.6	5.0	6.7	3.8	13.6*	5.5	5.0	24.6***	8.1	8.9	12.3**	0.7	2.0
Nempiteridae	2.2	0.1	1.0	1.4	3.1	0.5	1.1	2.7	10.3	0.6	3.3	5.0	4.3*	2.1
Pomadasyidae	—	—	5.9	6.3	3.7	0.4	26.4**	1.3	—	11.2**	0.2	0.5	1.4	1.1
Scombridae	9.0*	2.8	5.9	3.3	1.4	1.5	3.3	1.0	12.0	3.4	0.4	0.9	—	3.0
Serranidae	5.4	4.5*	5.9	5.8	2.4	1.7	1.1	2.7	1.7	7.8	2.2	4.7	—	2.0
Sparidae	—	0.8	0.7	5.8	8.4*	0.5	0.9	1.8	7.9	0.3	2.2	3.7	—	0.7
Sphyraenidae	—	0.3	0.5	0.3	4.2	2.4	2.1	1.6	0.5	2.9	1.3	9.8*	—	8.9*
Siganidae	—	0.3	—	0.7	0.1	—	0.1	0.7	—	—	—	—	—	—
Synodontidae	—	—	—	0.9	1.7	10.7	1.6	3.6	2.2	1.5	4.0	3.0	1.4	2.2
Ariommidae	—	—	1.0	—	0.4	41.9***	0.4	5.6*	2.6	8.1	0.4	1.4	—	0.9
Ariidae	—	0.3	2.7	1.2	1.4	4.1	1.3	5.2	13.6**	—	18.3***	4.5	1.4	8.1
Carcharhinidae	—	—	3.5	4.3	1.1	0.8	2.4	2.9	—	7.5	10.5	1.8	22.7**	9.4**
Clupeidae	4.9	0.6	1.0	0.7	0.1	0.5	4.8	16.2**	0.2	4.5	0.4	1.2	1.4	—
T. orientalis	—	—	0.5	0.3	0.2	1.7	0.1	0.2	0.5	—	0.9	2.8	0.7	0.2
Sepiolidae	—	—	0.5	—	0.2	0.1	0.05	0.1	1.9	0.3	0.2	1.9	0.7	0.2
Other Commerc.	—	4.9	—	—	—	—	—	0.2	0.1	0.5	0.3	1.0	—	—
Total Commercial	47.9	36.0	67.8	81.7	94.8	93.7	91.4	92.5	97.4	90.1	85.8	88.0	77.2	81.7
Dasyatidae	—	—	2.0	—	—	—	2.9	0.3	—	0.8	3.8		—	5.3
Leiognathidae	—	—	2.2	0.1	0.1	0.2	2.6	0.5	—	1.0	1.1	3.7	—	0.4
Pomacanthidae	33.6***	37.7***	—	2.7	0.2	—	0.1	0.01	—	—	—	—	—	—
Other non-commercial	18.4	26.3	28.0	15.5	4.9	6.1	3.0	6.7	2.6	9.1	9.0	8.3	22.8	12.6
Total non-commercial	52.1	64.0	32.2	18.3	5.2	6.3	8.6	7.5	2.6	10.9	13.9	12.0	22.8	18.3

*** = most predominant family ** = 2nd predominant family * = 3rd predominant family

It is also clearly evident that there is a high degree of variability in the percentage species composition between similar depth zones (Sub-Areas) of adjacent Areas. It is known that the bottom conditions influence demersal species composition and, hence, the variation may have been contributed by the differences in the relative proportions of the area covered by different types of bottom in the various Sub-Areas of similar depth range. To determine the predominant species groups occurring in the three basic types of bottom, the percentage species composition was analysed according to the types of bottom, which the sampling stations were located on, in the various Sub-Areas (Table 3). To examine the consistancy in the occurrence of these species groups in the three types of bottom, existing in different Areas and Sub-Areas, the frequency distribution of the occurrence of the first three predominant species groups in sandy, muddy and muddy-sand bottom in the various Sub-Areas, were plotted after crediting 3, 2 and 1 points to each species group, every time it appeared as either 1st, 2nd or 3rd predominant group, respectively (Fig. 3). It appeared that Carangidae, Lutjanidae and Lethrinidae showed tendencies of being predominant in all three types of bottoms, but the frequency of such occurrence declines from sandy to muddy-sand and muddy bottom. Varieties, such as Pomacanthidae, Ariidae, Dasyatidae and Serranidae tend to emerge as the predominant species groups in the muddy bottom, in depths less than 20Fm. In deeper water, groups such as Ariommidae, Ariidae, Mullidae and Synodontidae increase in significance in muddy-sand and muddy bottom. Pomadasyidae showed predominance in moderate depths (10 — 20Fm) on sandy or muddy-sand bottom.

Table 3

First three predominant families or species groups, according to their percentage species compositon, occurring in the three major types of bottom at various depth levels in the Qatar waters.

Depth	Area	Sandy bottom			Muddy-sand bottom			Muddy bottom		
		1. Pred. Gr.	*2. Pred. Gr.*	*3. Pred. Gr.*	*1. Pred. Gr.*	*2. Pred. Gr.*	*3. Pred. Gr.*	*1. Pred. Gr.*	*2. Pred. Gr.*	*3. Pred. Gr.*
5 — 10Fm	1	—	—	—	—	—	—	Pomacanthidae (34.4)	Carangidae (16.5)	Scombridae (9.2)
	3	Carangidae (20.7)	Lutjanidae (9.9)	Scombridae (6.5)	—	—	—	Lethrinidae (20.0)	Gerreidae (11.8)	Serranidae (10.6)
	6	Carangidae (4.8)	Carcharhinidae (22.5)	Nemipteridae (4.2)	—	—	—	—	—	—
10 — 20Fm	1	—	—	—	—	—	—	Pomacanthidae (38.0)	Serranidae (14.7)	Carangidae (9.6)
	3	Carangidae (29.2)	Lethrinidae (17.3)	Lutjanidae (11.8)	Carangidae (19.0)	Lethrinidae (12.2)	Lutjanidae (12.0)	—	—	—
	4	Carangidae (34.3)	Pomadasyidae (32.7)	Mullidae (5.8)	Lethrinidae (20.4)	Carangidae (19.3)	Pomadasyidae (12.0)	—	—	—
	5	Pomadasyidae (31.6)	Carangidae (14.8)	Lethrinidae (6.9)	Carangidae (17.3)	Pomadasyidae (10.4)	Lethrinidae (10.1)	Ariidae (25.3)	Clupeidae (23.8)	Carcharhinidae (10.8)
	6	Carangidae (41.5)	Lutjanidae (11.7)	Lethrinidae (10.5)	Carcharhinidae (27.3)	Sphyraenidae (25.8)	Lutjanidae (5.5)	Ariidae (33.6)	Dasyatidae (21.9)	Scombridae (8.0)
20 — 30Fm	3	—	—	—	Carangidae (42.3)	Lutjanidae (15.6)	Sparidae (8.3)	—	—	—
	4	Carangidae (27.1)	Clupeidae (26.8)	Lutjanidae (7.5)	Carangidae (27.7)	Lutjanidae (13.9)	Ariidae (9.5)	Carangidae (23.4)	Synodontidae (14.3)	Mullidae (12.8)
	5	—	—	—	Lethrinidae (21.5)	Lutjanidae (16.3)	Mullidae (14.2)	Ariidae (30.1)	CarcharHinidae (12.0)	Dasyatidae (8.1)
30 — 40Fm	3	—	—	—	Ariommidae (24.7)	Mullidae (20.0)	Synodontidae (13.7)	Ariommidae (48.9)	Mullidae (10.1)	Synodontidae (8.9)
	4	—	—	—	—	—	—	Mullidae (28.7)	Ariidae (15.4)	Lutjanidae (14.2)
	5	—	—	—	Carangidae (29.2)	Sphyraenidae (11.9)	Mullidae (9.4)	Mullidae (23.6)	Serranidae (17.2)	Lethrinidae (6.8)

Pred. Gr. = Predominant species group or family. ( )=Percentage of the group in the percentage species composition for the Sub-Areas.

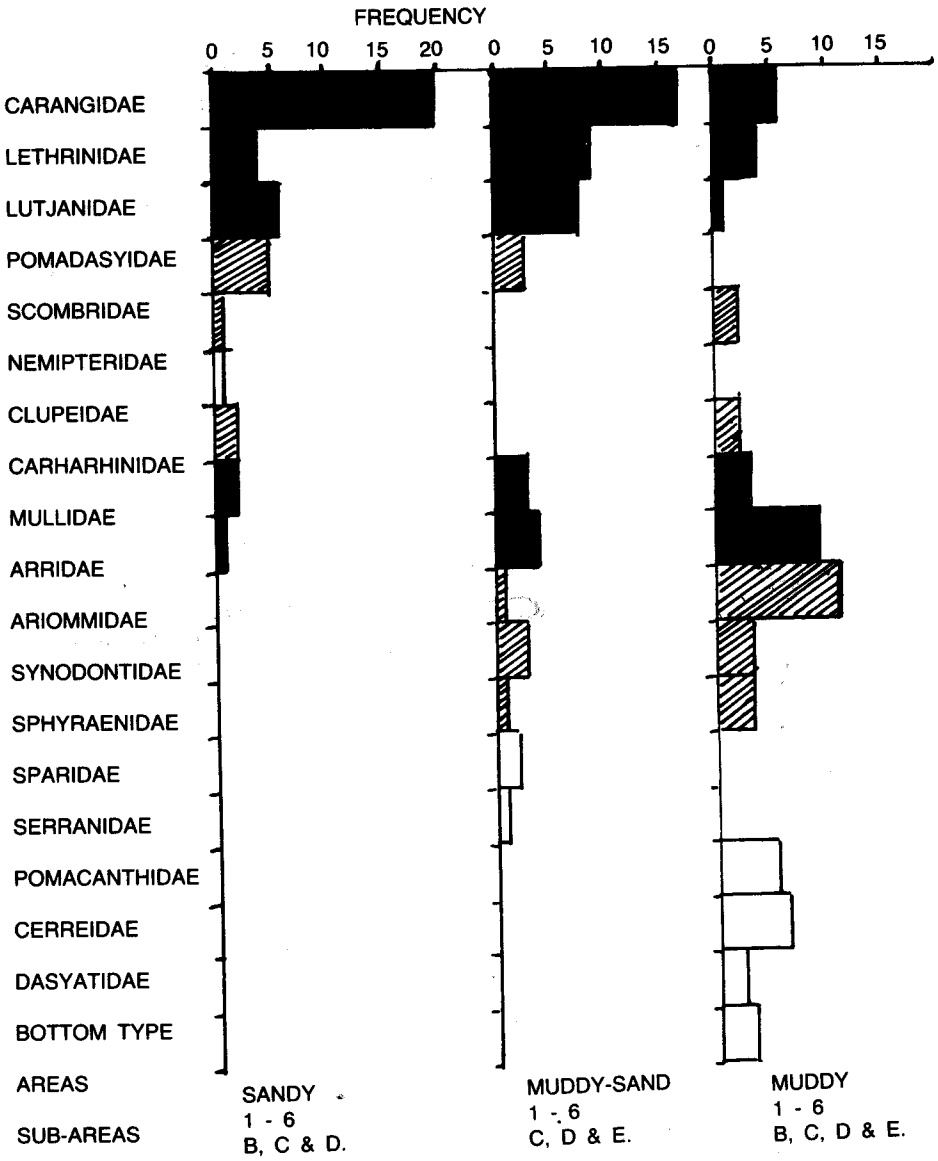

Fig. 3. Frequency of occurrence of predominent species groups, in the three basic types of bottom, in Qatar waters. (Dark = Occurring in all three types of bottom; Striated = Occurring in any two; Blank = Occurring in one type of bottom).

Variability of catch rates :

The catch rates (kg/hr) obtained with the sampling gear, is proportional to the density values, which are used in the estimation of biomass and subsequently in potential yield. Hence, the variation in the catch rates was examined in order to ascertain their effect on the mean density values calculated. Besides normal variation, influenced by the behavioural pattern of the gear in relation to that of the fish, differences in depth, bottom conditions, dynamic factors in the water, as well as seasonal changes in distribution, brought about by localised migration, contribute to large variance in the catch rate by the bottom trawl gear. The stratification process was aimed at reducing the variability and to obtain mean values close to the realistic ones.

The mean catch rates exhibited an increasing trend from shallow to deeper water and declined from sandy-through muddy-sand to muddy bottom (Table 4). Though these trands were clear, subdivisions of the Sub-Areas, according to the type of bottom, was found to cause a heavy reduction in the already small number of sampling stations in each Sub-Area and, hence, the mean catch rates for each Sub-Area was maintained for mean density calculations.

Table 4

Average catch rates for the sampling gear, according to bottom conditions in different depth zones.

	Depth Range	*Sandy Bottom*	*Muddy-sand bottom*	*Muddy bottom*
	5 — 10 Fm	262 kg/hr		
	10 — 20 Fm	609 kg/hr	439 kg/hr	273 kg/hr
	20 — 30 Fm	952 kg/hr	570 kg/hr	241 kg/hr
	30 — 40 Fm	—	336 kg/hr	342 kg/hr
Season	Depth Range	Sandy Bottom	Muddy-sand bottom	Muddy bottom
March — May and November	5 — 10 Fm	592 kg/hr		
	10 — 20 Fm	1,834 kg/hr		
	20 — 30 Fm	769 kg/hr		
	30 — 40 Fm	—		
March — May and October	5 — 10 Fm		—	145 kg/hr
	10 — 20 Fm		770 kg/hr	345 kg/hr
	20 — 30 Fm		378 kg/hr	167 kg/hr
	30 — 40 Fm		210 kg/hr	248 kg/hr
June - October	5 — 10 Fm	97 kg/hr	—	85 kg/hr
	10 — 20 Fm	380 kg/hr	426 kg/hr	192 kg/hr
	20 — 30 Fm	1,195 kg/hr	787 kg/hr	296 kg/hr
	30 — 40 Fm	—	523 kg/hr	405 kg/hr

The analysis of monthly catch rates showed ill defined variation patterns and, hence, the data were grouped for cool and warm seasons, when surface temperatures were below and above 29°C/30°C respectively.

The results indicated that the mean catch rates in waters less than 20 Fm deep, was lower in the warm season than in the cool season, but in deeper waters, the trend was vice versa (Table 4). This observation is supported by the results of commercial fishing activities close to the 20Fm isobath (Yesaki, 1979) and the catch rates of demersal species by artisanal fishery in waters less than 20 Fm deep (Sivasubramaniam and Ibrahim, 1981). This trend may have been influenced by possible movements of fish from shallow into deeper waters around Qatar, during the warm season. As each one of the Areas in the north and east of Qatar were sampled between March and September and only these Areas are significant in extent and catch rates, the mean catch rates for this period were considered reasonably good estimates for calculating the mean densities.

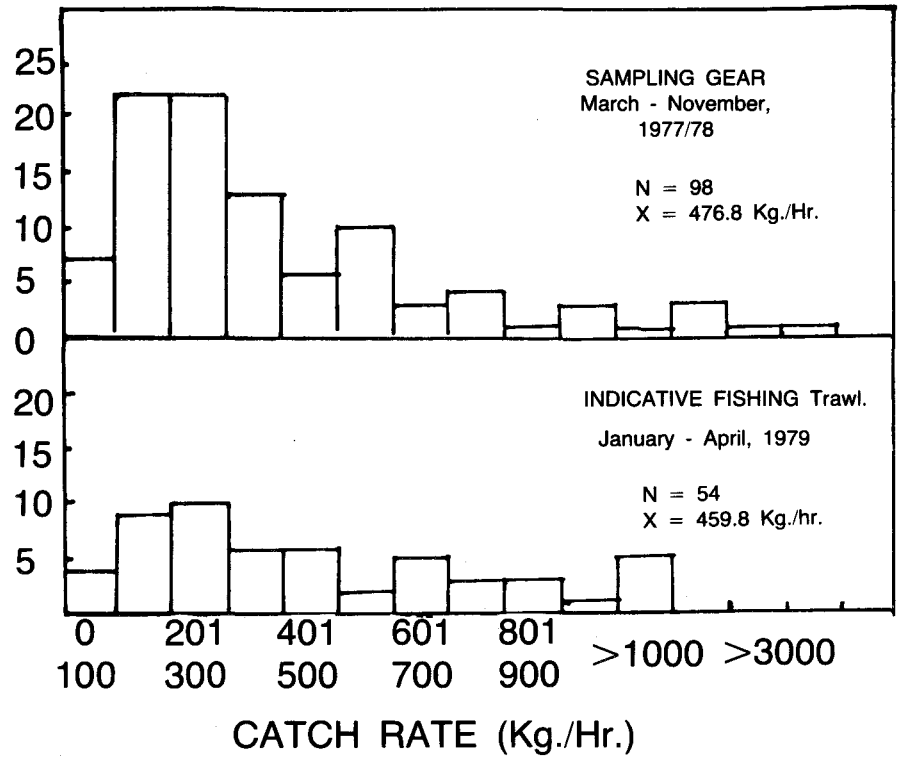

Fig. 4. Frequency distribution of catchrates related with sampling gear and indicative (commercial type) bottom trawl gear, in Qatar waters.

Frequency distribution of the catch rates, realised in the Qatar waters during the entire sampling period and that for the 'indicative fishing' (commercial type of operation) between January and April 1979, are shown in Figure 4. The mean catch rates per Sub-Area varied between 147 kg/hr and 1'102 kg/hr. On an Area basis, the mean catch rates tend to decline from Area 4 to 3, 5, 1 and 6 and on the Sub-Area or depth range basis, the mean catch rates tend to increase from 5 Fm to 30 Fm (Figure 5, 6 and 7).

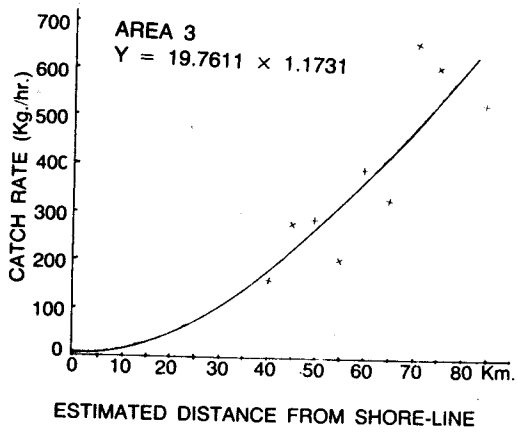

Fig. 5. Correlation between mean catch rate and approximate distance from shore-line, in Area 3.

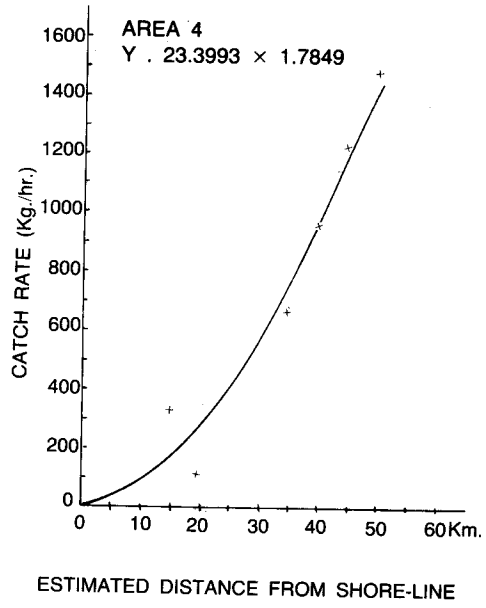

Fig. 6. Correlation between mean catch rate and approximate distance from shore-line, in Area 4.

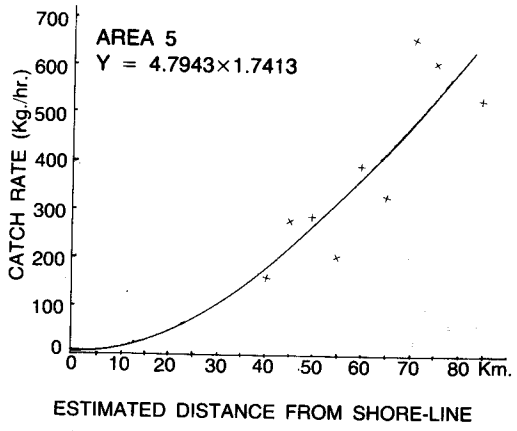

Fig. 7. Correlation between mean catch rate and approximate distance from shore-line, within Area 5.

Fish density distribution :

The mean density, being proportional to the mean catch rate, tends to follow the same distribution pattern. The mean density of demersal species around Qatar was estimated as 2.7 M. tons/km^2, which is not 'poor', in comparison to the known density values for other areas of the world and should perhaps be considered as one of the best in the Gulf, in terms of commercially valuable demersal species. In fact, the value of 3.5 M. tons/km^2 was for the Qatar waters actually surveyed, but the lesser value of 2.7 M. Tons was attributed to very low density values for the very shallow waters, obtained from the extra-polation of catch rate-distance curves (Figures 5, 6 and 7). The environmental factors around Qatar have contributed to an optimum depth range for density distribution of demersal species in each Area.

The mean density values for all demersal species (Table 5 and Figure 8):

10 Fm: mean density values tend to decline from Area 1 to 5 and increase again in Area 6.

10 — 20 Fm: the mean density is relatively higher with exceptionally high value in Area 4.

20 — 30 Fm: density range showed the highest values for most Areas and the trend is to decline from the highest value of 9'900 kg/km^2 in Area 3 to about 1900 kg/km^2 in Area 6.

over 30 Fm: the density tends to be less than that of 20-30Fm, except in Area 5.

Area 4 showed the highest density for the whole area with about 6'000 kg/km^2

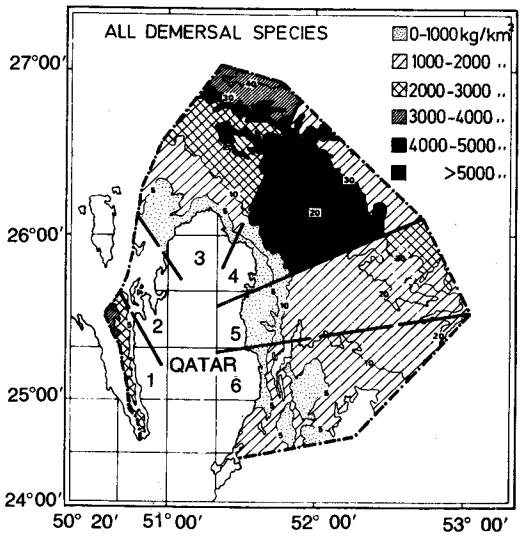

Fig. 8. Density distribution of demersal species in Qatar waters.

Table 5

Estimated mean densities and biomass of demersal species around Qatar.

Area code	Stratum code	km²	Commercial spp. gp.		Non-commercial spp. gp.		Total	
			mean density (kg)	biomass (M. tons)	mean density (kg)	biomass (M. tons)	mean density (kg)	biomass (M. tons)
1	A**	254	—	—	—	—	—	—
	B	643	963	620	1,044	670	2,007	1,290
	C	183	1,161	210	2,061	380	3,222	590
Sub total		1,080	1,004	830	1,271	1,050	2,276	1,880
2	A**	1,329	—	—	—	—	—	—
	B	68	—	—	—	—	—	—
Sub total		1,397						
3	A*	1,349	380.8	510	163.2	220	544	730
	B	1,189	1,273.5	1,510	544.5	650	1,818	2,160
	C	2,544	1,962.9	5,000	437.4	1,110	2,400	6,110
	D	1,035	9,414	9,740	504	520	9,918	10,260
	E	260	2,993.4	770	194.4	50	3,187.8	820
Sub total		6,377	2,748.9	17,530	399.8	2,550	3,148.8	20.080
4	A*	200	327.6	60	140.4	30	468	90
	B*	334	539.5	180	189.5	60	729	240
	C	2,821	8,623	24,330	554.4	1,560	9,177.3	25,890
	D	3,176	4,671.9	14,830	355.5	1,130	5,027	15,960
	E	666	1,831.5	1,220	49.5	30	1,881	1,250
Sub total		7,197	564.4	40,620	390.4	2,810	6,034.4	43,430
5	A*	963	168.7	160	72.3	70	241	230
	B	537	526.1	280	184.8	100	711	380
	C	4,210	2,546.1	10,720	279.9	1,180	2,826	11,900
	D	1,610	1,759.5	2,830	256.5	410	2,016	3,240
	E	597	2,687.4	1,600	272.7	160	2,960.1	1,760
Sub total		7,917	1,969.2	15,590	242.5	1,920	2,211.6	17,510
6	A*	1,904	168.7	320	72.3	140	241	460
	B	3,853	981	3,780	288	1,110	1,269	4,890
	C	5,434	1,395	7,580	302.4	1,640	1,697.4	9,220
	D*	183	1,564.5	290	343.4	60	1,908	350
Sub Total		11,374	1,052.4	11,970	259.3	2,950	1,311.7	14,920
Total (Surveyed)		28,221	3,000	84,740	380	10,600	3,470	95,340
Total* (Estimate)		5,470	329	1,800	124	680	453	2,480
Total** not estim.		1,651						
GRAND TOTAL		35,342	2,448	86,540	319	11,280	2,768	97,820

The mean density values for the commercially valuable species as a whole has a distribution pattern, similar to that for all demersal species; except that in the 5 - 10 Fm depth range it continues to decline from Area 3 to Area 6. Commercially valusble species are significantly higher in all Areas, except in Area 1, where non-commercial species exceed the commercially valuable species (Table 5 and Figure 9).

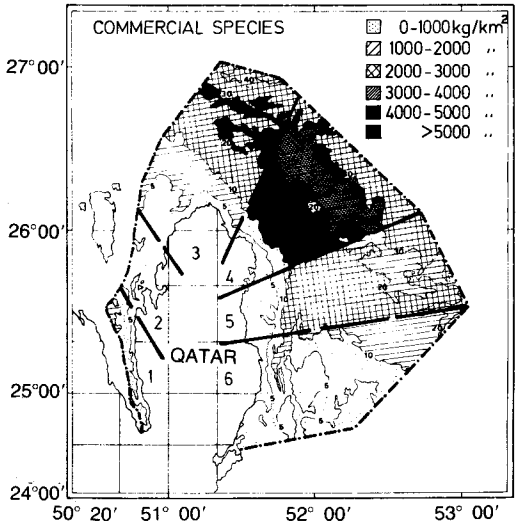

Fig. 9. Density distribution of commecially valuable demersal species in Qatar waters.

The density distribution of commercially valuable species groups, which contribute 2 % or more to the catch composition in any of the Sub-Areas, is presented below in the order of their abundance in the Qatar waters :

Carangidae has the highest density distribution in Qatar waters. Smaller species of the Genera
Carangoides,
Alepes,
Selar,
Selaroides,
Decapterus and
Trachyurus
contribute significantly to the density. The only larger species of significance is

Gnathanodon speciosus.
Caranx sem and
Caranx ignobilis

contribute much less to the density of this family. The density distribution of this family is moderate to good in all Sub-Areas between 10 - 10 Fm depth and tends to decline on either side of this depth range, Observations of the inshore fishery proved their poor abundance in shallow waters less than 10 Fm. Higher densities are in the Areas north-east and east of Qatar (Figure 10).

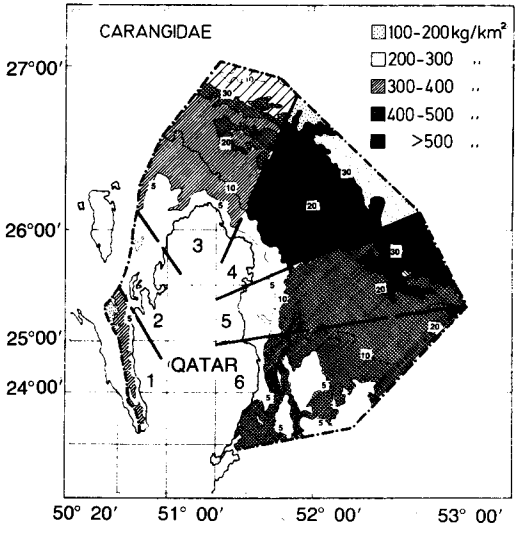

Fig. 10. Density distribution of the Family Carangidae, in Qatar waters,

Pomadasyidae is the second most abundant family in the Qatar waters with relatively high density in the 10-20 Fm depth zone, particularly north-east and east of Qatar, which tends to decline rapidly in the deeper part. Species, such as

Plectorhynchus pictus and
Plectorhynchus gaterinus

contribute significantly to the density of this family, while species, such as

Plectorhynchus fangi,
P. schotaf,
P. sordidus and
Pomadasys multimaculatus do less.

Species of this family are rather insignificant in the catches of existing fishery in the shallow waters (less than 10 Fm), indicating very low density in this depth range (Figure 11).

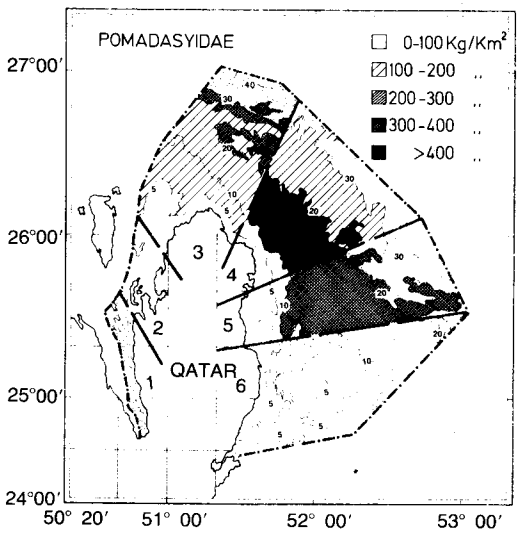

Fig. 11. Density distribution of the Family Pomadasyidae, in Qatar waters.

Lethrinidae is a commercial valuable group with main concentration in the 10-30 Fm depth range, east, north-east and north of Qatar. Mainly represented by

Lethrinus nebulosus and
Lethrinus lentjan

in all Areas around Qatar and to a lesser extent by
Lethrinus miniatus and

Lethrinus kallopterus.

The density declines in the deeper waters and the inshore waters (Figure 12). Rather poor in the south-west and south-east of Qatar.

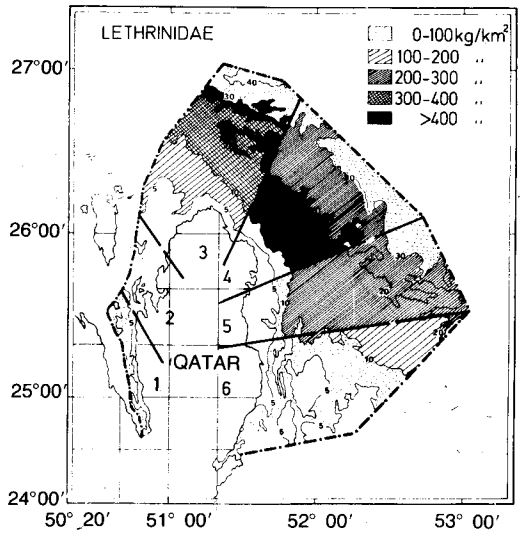

Fig. 12. Density distribution of the Family Lethrinidae, in Qatar waters.

Lutjanidae has a distribution pattern almost similar to that of lethrinidae and its density values are only slightly less than that of the latter. Relatively high densities are in the 20-30 Fm depth range, east north-east and north of Qatar and decreases gradually into the deeper and more shallow waters. The species mainly contributing to the density are

Lutjanus malabaricus,
Pinjalo pinjalo and
Lutjanus sanguineus.
Lutjanus fulviflamma and
Lutjanus russelli

contribute less and species, such as

L. kasmira,
L. johni and
L. lineolatus

are common, but make insignificant contribution to the density of this family in Qatar waters (Figure 13). Young fishes of this family contribute to the low density in the inshore waters.

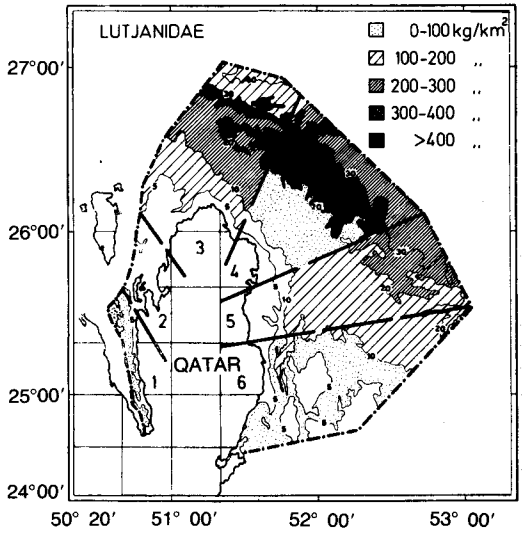

Fig. 13. Density distribution of the Family Lutjanidae, in Qatar waters.

Mullidae has relatively high density (> 300 kg/km^2) in the 10-40 Fm depth range in the north and north-east coast of Qatar, which declines rapidly, not only in the inshore waters, but also south-west and south-east of the abovementioned Areas.

Parupeneus Pleurotaenia and
Upeneus sulphureus

are the predominant species of the Family and the other species, such as

Upeneus asymetricus and
Upeneus tragula

contribute less to the density of this family in Qatar waters.

Upeneus sulphureus

contributes to the very low density in the inshore waters and this family is seen occasionally in the inshore fisheries of Qatar (Figure 14).

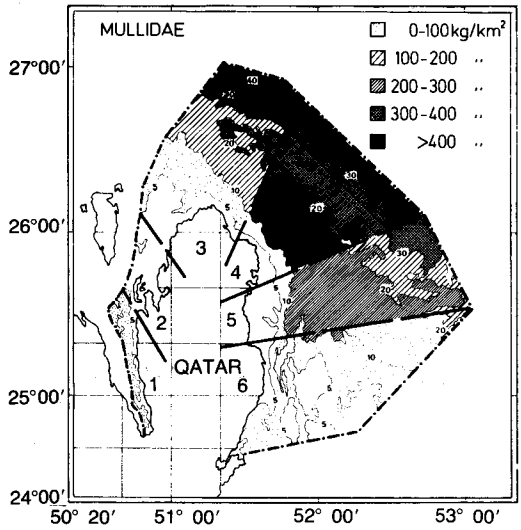

Fig. 14. Density distribution of the Family Mullidae, in Qatar waters.

Carcharhinidae is rather a semi-commercial species group. It has relatively high density along the entire eastern side of Qatar in 10-30 Fm depth range.

Carcharias spp.

contribute more to the density of this group than the **Carcharhinus** species (Figure 15).

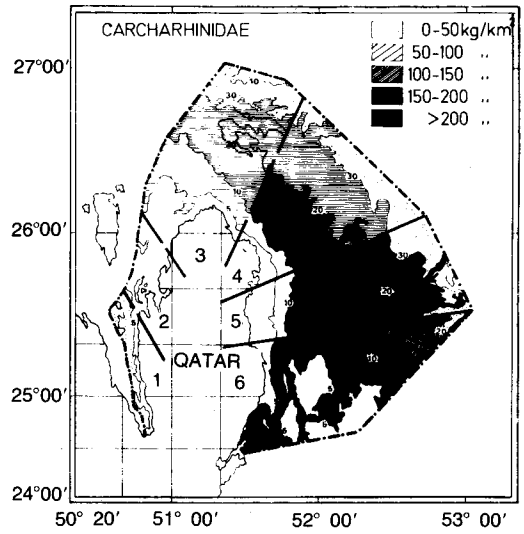

Fig. 15. Density distribution of the Family Carcharhinidae, in Qatar waters.

Ariidae

is represented by only one species and the density is relatively moderate in the Areas around Qatar. Over 200 km/km² being observed in the 10 - 20 Fm depth on the east coast and 20 - 40 Fm in the north and north-east. Elsewhere, the density is very low. This group also has a limited market in the country. (Fig. 16).

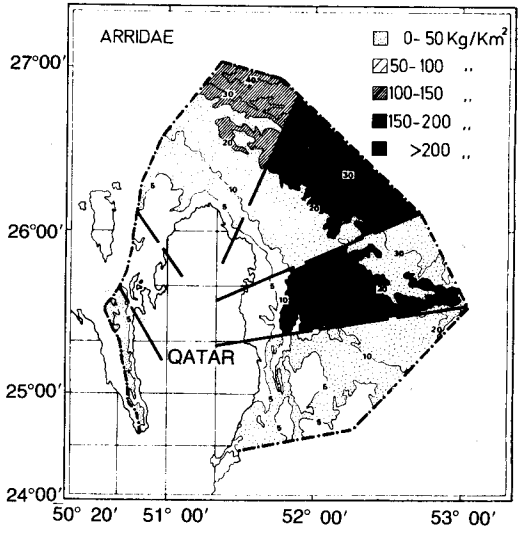

Fig. 16. Density distribution of the Family Arridae, in Qatar waters.

Serranidae is one of the popular groups of fishes in the Gulf region, but shows a moderate density around Qatar. However, compared to other parts of the Gulf, groupers are relatively concentrated around Qatar and densities of 100 — 250 kg/km^2 occur between 10 — 30 Fm north, north-east and east of Qatar.

Epinephelus tauvina

is the most predominant species, which is followed by

E. chlorostigma,
E. areolatus,
Cephalopholis miniatus and

E. jayakari.
Aethaloperca rogga

contributes negligibly to the density of this family in Qatar waters. The existing fishery in the inshore waters indicate a low density, contributed mainly by young
E. Tauvina (Figure 17).

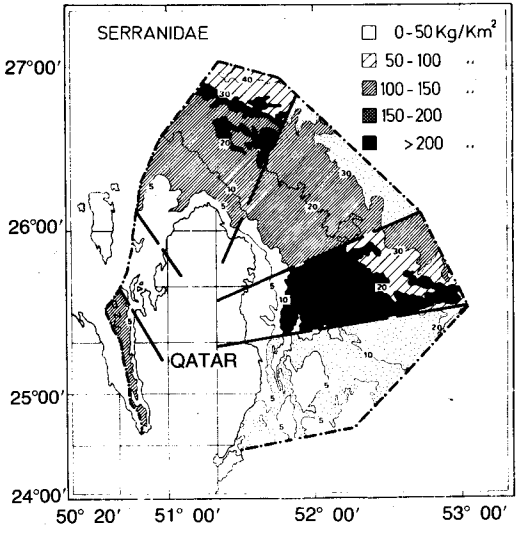

Fig. 17. Density distribution of the Family Serranidae, in Qatar waters.

Sphyraenidae represented by two species :

Sphyraena jello and
S. obtusata.

The latter is small sized and almost entirely demersal in habitat whereas the former is vulnerable to the demersal fishery sampling, mainly when they are young. Older fish become available to the pelagic fishery around Qatar. The former is more predominant than the latter and, hence, the mean density estimated from the trawl sampling may be an underestimation. However, the family shows moderate densities in the Areas around Qatar and relatively higher values tend to occur in 20 - 40 Fm depth in the north and east. Slightly lesser concentration appeared in 10 - 20 Fm depth range in the north-east and south-east (Figure 18).

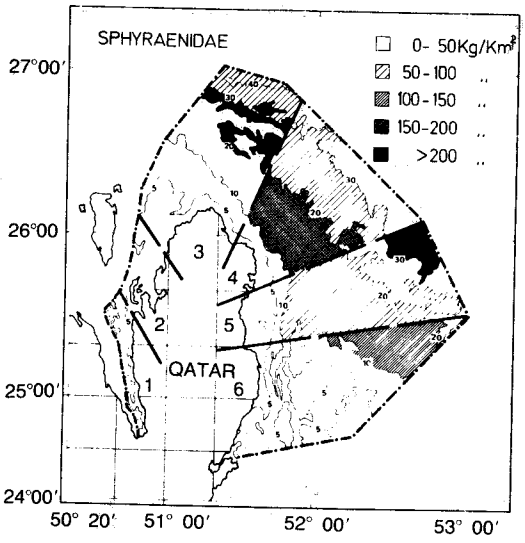

Fig. 18. Density distribution of the Family Sphyraenidae, in Qatar waters.

Ariommidae is represented by one species :

Ariomma indicia,

which gnerally inhabits deeper waters around Qatar. Moderately high densities of about 200 kg/km² occur beyond the 20 Fm depth and poor values in other depth ranges. Hence, the overall density of this group is very moderate (Figure 19).

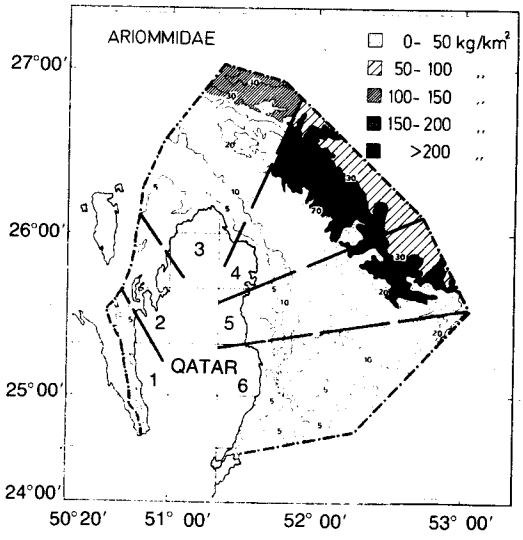

Fig. 19. Density distribution of the Family Ariommidae, in Qatar waters.

Sparidae is very common and a widely distributed family in Qatar waters, but its density is evenly low in all Areas, except for a small Sub-Area between 20 - 30 Fm in the north and beyond 30 Fm in the north-east (Fig. 20).

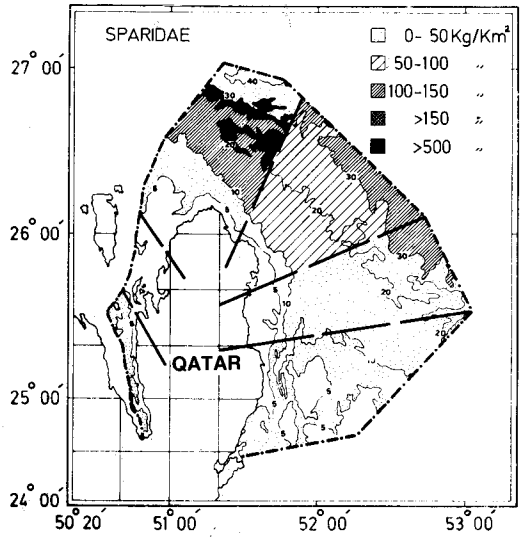

Fig. 20. Density distribution of the Family Sparidae, in Qatar waters.

Argyrops spinifer and
Mylio bifasciatus

are the predominant species in the off-shore waters, while

Rhabdosargus sarba

contributes to the density in the inshore waters.

Mylio latus,
Crenidens crenidens,
Diplodus kotoschyi and
Pagellus sp.

though commonly found, do not contribute significantly to the density of this group.

Nemipteridae also has low density in Qatar waters. Very small patches of moderately high difensity (200 - 400 kg/km^2) was observed in the 20-40 Fm depth range north/north-east of Qatar (Figure 21).

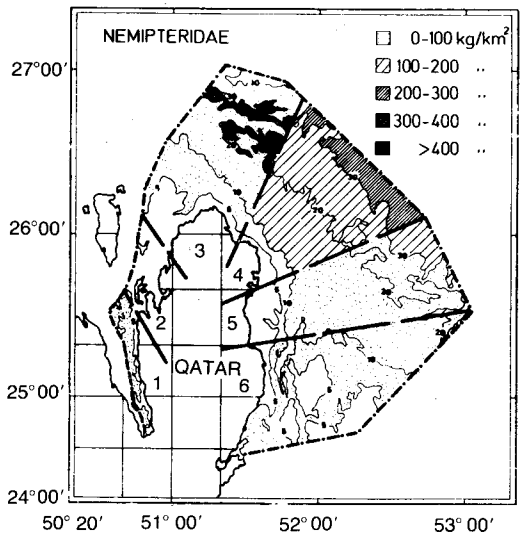

Fig. 21. Density distribution of the Family Nemipteridae, in Qatar waters.

Nemipterus tolu and
Nemipterus delagoae

are the main contributors to the density distribution.

Scolopsis ghanam,
S. Bimaculatus and
S. ruppelli

though common both inshore and off-shore, do not contribute significantly to the density of this group in Qatar waters.

Synodontidae is also another low density group, represented by

Saurida tumbil and
Saurida undosquamis

more or less equally. Its density tending to increase towards deeper end of north and north-east Areas. This group has an extremely low density in waters less than 10 Fm (Figure 22).

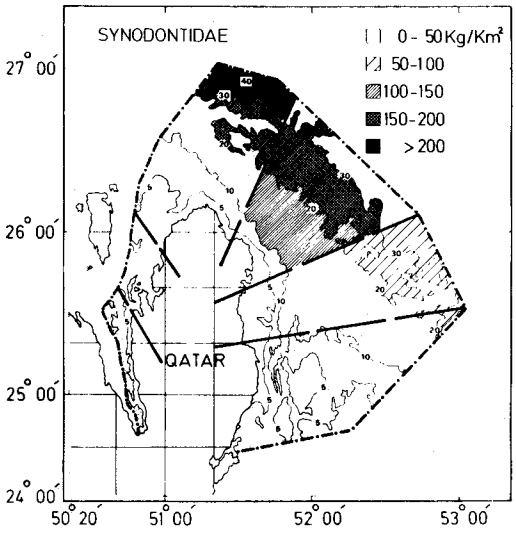

Fig. 22. Density distribution of the Family Synodontidae, in Qatar waters.

Gerreidae

has a very low density in almost the entire off-shore range around Qatar. As a result of the low mean density in the surveyed Sub-Area, the biomass and potential yield estimated were extremely low. However, the study of the inshore fishery in Qatar over one year, revealed that there is higher density in the waters less than 10Fm deep around Qatar. Of the two species.

Gerres Oyena and
G. filamentosus,

contributing to the higher density in the inshore waters, the former species appears to be slightly more predominant than the latter. It is considered that the biomass determined from the

survey results is an underestimation and it is conjectured that a more realistic biomass value would be about twice that of the estimated value (Figure 23).

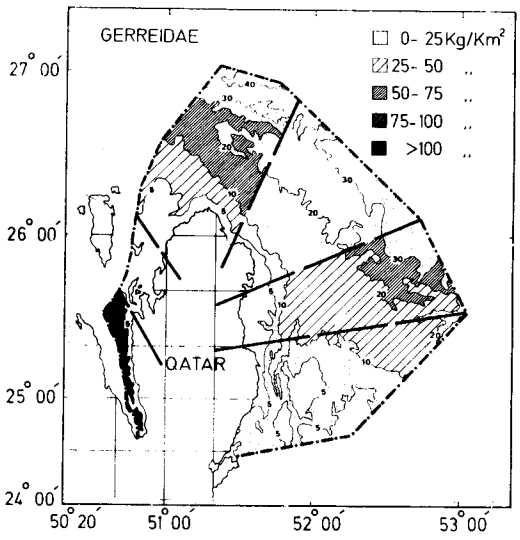

Fig. 23. Density distribution of the Family Gerreidae, in Qatar waters.

Siganidae is another group with a trend similar to that of Gerreidae. It is a very popular variety of fish in Qatar, represented by

Siganus canaliculatus and
Siganus jaavus.

Evenly low density in the off-shore range tends to produce a potential value, which is exceeded by the present level of production. In this case too, there is a relatively better fishery for the group in the inshore water, than in the offshore range beyond 10Fm depth. The biomass value, determined from the survey, is an underestimation, because higher concentration of this group seems to be in the unsurveyed inshore waters, than in the surveyed part.

Siganus canaliculatus

seems to be the predominant species in the inshore range around Qatar (Figure 24).

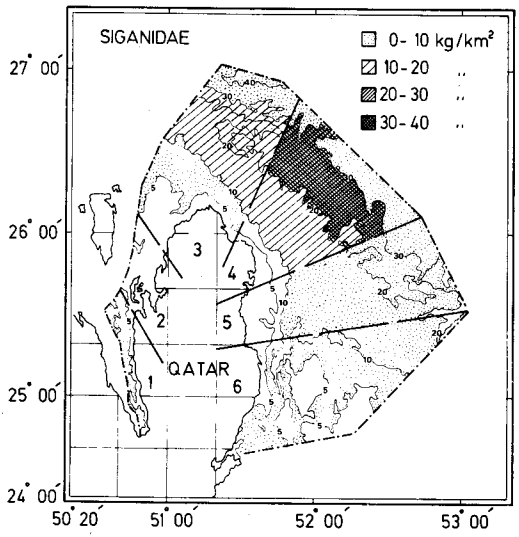

Fig. 24. Density distribution of the Family Siganidae, in Qatar waters.

Among the other families of commercial or semi-commercial (limited market in Qatar) values, but with extremely low densities,

ACARIDAE
SILLAGINIDAE and
PLATYCEPHALIDAE
are conspicuous groups.

Non-commercial species in Qatar waters are numerous, as already discussed. Predominant families in the non-commercial category are :

POMACANTHIDAE
RHINOBATIDAE,
DASYATIDAE,
MYLIOBATIDAE,
BALISTIDAE,
TETRADONTIDAE,
THERAPONIDAE and
MONOCANTHIDAE.

Pomacanthidae represented by
Pomacanthus-aculosus,

appeared as the single predominant species in Area 1, exceeding the densitites of all other species in that Area. Density distribution of all non-commercial species grouped together, exhibit very high values in the south-west, moderately high values in the norh and north-east and evenly moderate values for the Sub-Areas in the east and south-east.

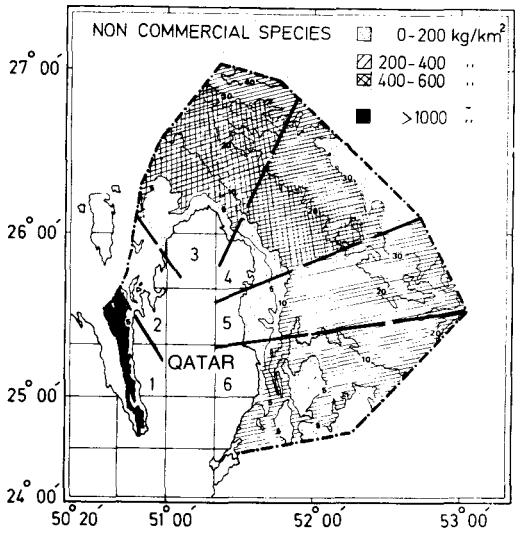

Fig. 25. Density distribution of the non-commercial category of fishes in Qatar waters.

Biomass :

The total biomass for demersal species around Qatar is estimated as 97'800 M. tons. The biomass calculated for the Sub-Areas actually sampled, is about 95,000 M. tons and the balance 2,800 M. tons is a modest estimate for the unsurveyed shallow waters, made according to the method already described. The biomass estimates for the various Sub-Areas are presented in Table 5. The highest value of nearly 26,000 M. tons was obtained for the Sub-Area 4 C and in all other Sub-Areas, the biomass was below 15,000 M. tons. Among the six Areas, Area 4 alone contains nearly 45 % of the estimated total biomass (Table 5). Considering the depth zones around Qatar, the 10 - 20 Fm depth range contains about 55 % of the total biomass of demersal species.

The biomass of commercially valuable demersal species is approximately 86,500 M. tons and that of non-commercial species is about 11,300 M tons. The biomass for Area 2 was not estimated, as little is known of that Area and the catch composition of the two adjacent Areas are significantly different to permit any extrapolation. Considering that the neighbouring Area 1 has almost the same surface area with a biomass of about 1,880 M. tons, it is very likely, that the biomass of Area 2 would also be equally small to have a significant impact on the estimated potential yield for the entire Qatar waters

At the time of the survey, the stocks under consideration were being exploited by both artisanal and commercial scale fisheries and, hence, estimates of the production were examined to determine the effect of the fishery on the biomass. As no statistics on the production by artisanal fishery in Qatar is available for the relevant period (1977/78), the production figure calculated on the basis of the systematic sampling, conducted by the authors during 1980/81, was applied. The commercial scale trawling in the Qatar waters is carried out by Qatar and Bahrain and the production by Bahrain vessels in 1978 was made available, but in the case of Qatar, the production by varieties was available only for 1980. It has been estimated, that nearly 50 % of the commercial fishery catches are discarded at sea (Yesaki 1979) and, hence, the equivalent of this was added to the landed quantity. Number of samples of discarded fish were obtained through the courtesy of the Qatar National Fishing Company and their analysis revealed that 35 to 45 % of the discarded fish are truly non-commercial or trash species and the remainder is made up of commercialy valuable species, generally below 12cm in total length.

Conclusion

The total production of demersal species was estimated to be 2,900 M. tons, including the discarded fish (Sivasubramaniam and Ibrahim 1981). The existing fisheries are almost entirely on the eastern side of Qatar with a little on the north. Except for game fishery, there is hardly any fishery on the west coast of Qatar. Combined artisanal and commercial fisheries are well spread out to cover a very large extent of the Qatar waters, including the waters surrounding the Halul island.

The production level, in relation to the estimated biomass, indicated that the fishing is not intensive in the Qatar waters and that the yield is in-significant in comparison to the biomass. Hence, adopting Clark's approach (1978) to such a status of the standing stock, the instantaneous total mortality rate (Z) was estimated as 0.529 and the maximum potential yield as 25,000 M. tons, of which 22,000 tons are of commercially valuable species and 3,000 tons are of non-commercial species.

Bearing in mind that there are very low density Sub-Areas, which may be un-economical to fish, caution areas around oil rigs, where fishing may not be possible, very shallow banks, reefs and rocky outcrops, which may be inaccessible to crafts or unsuitable for operating fishing gears, it is conjectured that about 75 % of the maximum potential yield may be available to the fishery. Accordingly, the maximum potential yield for commercial and non-commercial demersal species would be in the regions of 17,000 M. tons and 2.200 M. tons respectively. Deducting present yield, the surplus potentials are estimated as 14,000 M. tons of commercially valuable species and 2,000 M. tons of non-commercial species. Figure 26 gives an indicication of the relative proportions of the exploitable maximum potentials and the present levels of yield, for various groups of fishes. As already dicussed, the maximum potential yields for the Families Gerreidae and Siganidae are underestimated and the probable levels shown in dotted lines are subjective.

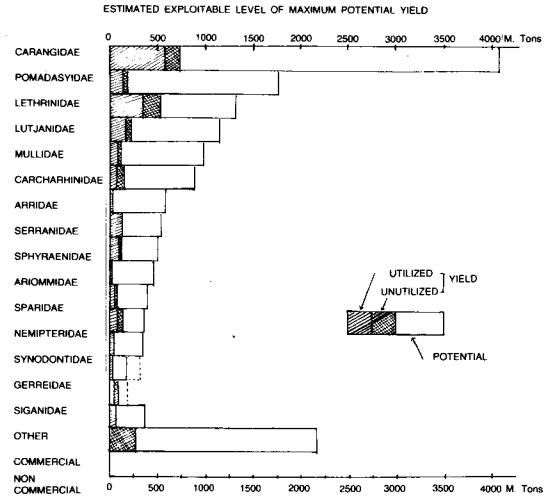

Fig. 26. Indication of the estimated exploitable levels of Maximum Potential Yields for major demersal fish groups in Qatar waters, in the descending order of abundance, and the estimated levels of present yield from that area, through artisanal and commercial fisheries.

It must be mentioned that the boundaries, within which the resources have been evaluated, are not the boundaries for the stocks. The data available are not sufficient to identify the limits of distribution of the stocks in Qatar waters. Hence, the possibilities of the stocks in Qatar waters, being in common with those in the adjacent waters of the United Arab Emirates, Saudi-Arabia and Bahrain, cannot be over-looked. If such is the case, then the degree of exploitation by the

neihbouring states will influence the optimum level of exploitation within Qatar waters. Only a survey programme, specifically designed and perhaps executed jointly with the neihbouring states, will accomplish this requirement. Until such time, the information presented in this study can provide guidance to planning fishery development and management of the resources and also serve as a source of information for marine science students in Qatar.

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ANNEX 1

List of demersal species, identified during the survey and from the catches of existing fishery in Qatar waters.

Number 1: Commercially valuable, **Number 2:** Semi-commercial or limited market. **Number 3:** Non-commercial.

SCIENTIFIC NAME	*COMMON NAME*	*GULF NAME*	*No.*
ARIIDAE			
Arius thalassinus (Rupell)	Sea catfish	Chem	2
ACANTHURIDAE			
Acanthurus lineolatus (Linnaeus)	Surgeonfish	Jeen	3
ARIOMMIDAE			
Ariomma indica (Day)	Indian driftfish	Bankarah	1
BALISTIDAE			
Abalistes stellaris (Block/Schneider)	Starry triggerfish	Homara	3
BOTHIDAE			
Bothus pantherinus (Ruppell)	Leopard flounder	Khawfaah	3
Pseudorhombus arsius (Hamilton/Buchanan)	Large tooth flounder	Khawfaah	3
CARANGIDAE			
Alepes mate (Cuvier)	Crevalle		1
Carangoides bajad (Forsskal)	Yellow spot cavalla	Korary	1
Carangoides malabaricus (Bloch/Schn.)	Malabar cavalla	Zobaidy	1
Carangoides fulvoguttatus (Forsskal)	Cavalla		1
Carangoides ferdau (Forsskal)	Ferdau's cavalla	Farkh el-jib	1
Caranx ignobilis (Forsskal)	Yellowfin jack		1
Caranx sem (Cuvier)	Jack		1
Caranx sexfasciatus (Quoy/Gaimard)	Dusky lack		1
Decapterus kiliche (Cuvier)	Scad	Sadah	1
Gnathanodon speciosus (Forsskal)	Toothless trevally	Rabib	1
Scomberoides commersonianus (Lacepede)	Queenfish	Bisar	1
Selar crumenophthalmus (Bloch)	Bigeye scad	Dordoman	1
Selaroides leptolepis (Valenciennes)	Yellow stripe trevally		1
Seriolina nigrofasciata (Ruppell)	Black banded trevally	Haman	1
Trachinotus blochii (Lacepede)	Snub-nose Pompano		1
Trachurus indicus Necrassov	Horse mackerel		1
CARCHARHINIDAE			
Carcharias palasorrah (Cuvier)	Grey dog shark	Gargoor	
CHIROCENTRIDAE			
Chirocentrus dorab (Forsskal)	Dorab wolf herring	Hoff	1
CHAETODONTIDAE			
Chaetodon melapterus Guichenot	Butterflyfish	Anfooz	3

SCIENTIFIC NAME	*COMMON NAME*	*GULF NAME*	*No.*
Chaetodon obscurus Boulenger	Dark butterflyfish	Anfooz	3
Chaetodon vagabunda (Linnaeus)	Heniochus acuminatus (Lineeaeus)	Anfooz	3
Pennant coralfish		Anfooz	3
DASYATIDAE			
Himanture uarnak (Forsskal)	Tiger ray		3
FISTULARIDAE			
Istularia villosa Klunzinger	Flute mouth	Hakool	3
GERREIDAE			
Gerres filamentosus (Cuvier)	Whipfin mojarra	Bedh	1
Gerres oyena (Forsskal)		Bedh	1
GYMNURIDAE			
Gymnura poecilura (Shaw)	Butterfly ray		3
LABRIDAE			
Choerodon robustus (Gunther)	Wrass		2
LEIOGNATHIDAE			
Leiognathus bindus (Valenciennes)	Ponyfish	Sawayah	2
Leiognathus sp.	Ponyfish	Sawayah	2
LETHRINIDAE			
Lehtrinus lentjan (Lacepede)		Shery	1
Lethrinus miniatus (Bloch/Schneider)	Longface emperor	Soly	1
Lehtrinus nebulosus Forsskal	Starry pigface bream	Shery	1
Lehtrinus kallopterus (Bleeker)	Orange spotted emperor	Shery	1
LUTJANIDAE			
Caesio caerulaureus (Lacepede)	Blue & gold fusilier		2
Lutjanus lineolatus (Ruppelli)	Bigeye snapper	Niser	2
Lutjanus malabaricu (Bloch/Schn.)	Malabar red snapper	Niser	1
Lutjanus sanguineus (Cuvier)	Blood snapper	Niser	1
Lutjanus fulviflamms (Forsskal)	Black spot snapper	Niser	1
Lutjanus russelli (Bleeker)	Russel's snapper	Hamra	1
Lutjanus johni (Bloch)	John's snapper	Niser	1
Lutjanus kasmira (Forsskal)	Blue/yellow snapper	Qazan	1
Pinjalo pinjalo (Bleeker)	Pinjalo snapper	Sendkan	1
MONOCANTHIDAE			
Paramonocanthus choirocephals (Bleeker)	Pigface leather jacket	Homara	3
Stephanolepis diaspros (Fraser-Brunner)	Reticulate filefish		3
MULLIDAE			
Parupeneus pleurotaenia (Playfair)	Goatfish	Sultan Ibrahim	1

SCIENTIFIC NAME	*COMMON NAME*	*GULF NAME*	*No.*
Upeneus asymetricus (Lachner)	Goatfish	Sultan Ibrahim	1
Upeneus sulphureus (Cuvier)	Yellow lined Goatfish	Sultan Ibrahim	1
Upeneus tragula Richardson	Dark band Goatfish	Sultan Ibrahim	1
MYLIOBATIDAE			
Aetomyleus nichofii (Bloch/Schneider)	Eagle ray		3
MURAENOSOCIDAE			
Muraenosox cinereus (Forsskal)	Dogtooth pike conger		3
NEMIPTERIDAE			
Nemiptereus delagoae Smith	Delagoae threadfin bream	Basy	1
Nemipterus tolu (Valenciennes)	Notched threadfin bream	Basy	1
Scolopsis bimaculatus (Ruppell)	Two spotted monocle"		
Scolopsis ruppelli (Cuvier)	Monocle bream	Ebyeemy	1
Scolopsis ghanam (Forsskal)	Monocle bream	Ebyeemy	1
ORECTOLOBIDAE			
Chiloscyllium grisseum (Muller/Henle)	Carpet shark		3
OSTRACIONTIDAE	Boxfishes		3
PLATYCEPHALIDAE			
PLATYCEPHALUS INDICUS (Linnaeus)	Indian flathead	Thawr Amer	2
Platycephalus maculipinna Regan	Spotted flathead	Thawr Amer	2
PLATACIDAE			
Platax orbicularis (Forsskal)	Round batfish		1
Platax teira (Forsskal)	Longfinned batfish		1
POMACANTHIDAE			
Pomacanthus maculosus (Forsskal)	Butterfly fish	Anfooz	3
POMACENTRIDAE			
Abudefduf saxatilis vaigiensis (Quoy/Gaimard)	Waigen damselfish		3
Dascyllus trimaculatus (Ruppell)	White spotted puller		3
PLOTOSIDAE			
Plotosus anguillaris (Bloch)	Striped catfish eel		3
POMADASYIDAE			
Plectorhynchus fangi (Whitley)	Sweetlip	Khobar	1
Plectorhynchus gaterinus (Forsskal)	Sweetlip	Kashrah	1
Plecorhynchus pictus (Thunberg)	Painted sweetlip	Motawah	1
Plectorhynchus schotaf (Forsskal)	Grey sweetlip	Yanamm	1
Plectorhynchus sorididus (Klunzinger)	Brown swwetlip		1
Pomadasys multimaculatus (Playfair)	Blotched grunt		1
Rhonciscus stridens (Forsskal)	Banded grunter	Yemyam	3

SCIENTIFIC NAME	*COMMON NAME*	*GULF NAME*	*No.*
PRICANTHIDAE			
Priacanthus hamrur (Forsskal)	Dusky finned bigeye		1
Priacanthus tayenus Richardson	Spotffined bigeye		1
RHINOBATIDAE			
Rhinobatos granulatus Cuvier	Granulated shovelnose ray	Hariry	3
Rhynochobatus djiddensis (Forsskal)	White spotted shovelnose ray	Hariry	3
RHINOPTERIDAE			
Rhinopterus adspersa (Muller/Henle)	Cow ray		3
SCARIDAE			
Scarus ghobban (Forsskal)	Flame parrotfish	Jeyoon	2
SCORNPAENIDAE			
Pterois russelli (Bennet)	Scorpion fish	Dajajah	3
SERRANIDAE			
Cephalopholis miniatus (Forsskal)	Vermilion seabass	Shninwa	1
Epinephelus areolatus (Forsskal)	Areolated grouper	Qatmah	1
Epinephelus chlorostigma (Valenciennes)	Brown spotted grouper	Qatmah	1
Epinephelus jayakari (Boulenger)	White spotted grouper	Hamoor	1
Epinephelus tauvina (Forsskal)	Greasy grouper	Hamoor	1
Aethaloperca rogga (Forsskal)	Dusky rock bass		2
SIGANIDAE			
Siganus canaliculatus (Park)	White spotted spinefoot	Safy	1
Siganus javus (Linnaeus)	Streaked spinefoot	Safy	1
SILLAGINIDAE			
Sillago sihama (Forsskal)	Silver sillago	Hasoom	1
SOLEIDAE			
Synaptura orientalis (Bloch/Schneider)	Oriental sole	Kharfaah	3
Pardachirus marmotus (lacepede)	Spotted sole	Mazlaqan	3
SPARIDAE			
Argyrops spinifer (Forsskal)	Longspine seabream	Koofer	1
Diplodus kotschyi (Steidachner)	One spot seabream	Bent Nokhazah	1
Crenidens crenidens (Forsskal)	Crenate tooth seabream		1
Mylio bifasciatus (Forsskal)	Porgy	Fasker	1
Mylio latus (Houttuyn)	Yellowfin seabream	Shaam	1
Pagellus sp.	Seabream		1
Rhabdosargus sarba (Forsskal)	Goldlined seabream		1

SCIENTIFIC NAME	*COMMON NAME*	*GULF NAME*	*No.*
SPHYRAENIDAE			
Sphyraena jello (Cuvier)	Banded barracude	Dwelmi	1
Sphyraena obtusata (Cuvier)	Obtuse barracuda	Swelmi	1
SYNODONTIDAE			
Saurida tumbil (Bloch)	Greater lizardfish	Hasoom	1
Saurida undosquamis (Richardson)	Brush tooth lizardfish		
TETRADONTIDAE			
Chelonodon patoca (Hamilton/Buchanan)	Gangetic blowfish	Fegl	3
Arothron stellatus (Bloch)	Starry blowfish	Fegl	3
THERAPONIDA			
Pelates quadrilineatus (Bloch)	Fourlines therapon		3
Therapon jarbua (Forsskal)	Jarbua therapon	Zebah	3
Therapon theraps (Cuvier)	Large scaled therapon	Zeeb	3
Therapon puta (Cuvier)	Therapon	Zamroor	3
TRIACANTHIDAE	Triple spine		3
TRICHIURIDAE	Cutlassfish		3
TORPEDINIDAE			
Torpedo marmoratus Risso	Electric ray		3

« مخزون الأسماك القاعية في المياه القطرية »

سيفا سبرامانيام محمد أمين إبراهيم
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ملخص

تم في هذا البحث تحليل البيانات الأصلية لسفن البحوث التي اشتركت في المشروع الأقليمي لمسح وتنمية الثروة السمكية في الخليج .

حيث تم تحليل بيانات ٩٨ محطة شغلتها هذه السفن في المياه القطرية خلال المدة ١٩٧٧ ـ ١٩٧٩م هذا بجانب البيانات المحلية التي جمعناها خلال عام ١٩٨٠ ـ ١٩٨١م من مراكز تجميع الأسماك في دولة قطر .

فقد أظهرت هذه الدراسة أن المياه القطرية التي تبلغ مساحتها حوالي ٣٥ ألف كيلو متر مربع أي ما يعادل حوالي ١٥٪ من المساحة الكلية للخليج تمثلها ١٧٪ فوق أعماق حتى ٥ قامة ، ١٨٪ من ٥ ـ ١٠ قامة ، ٤٣٪ من ١٠ ـ ٢٠ قامة ، ١٧٪ من ٢٠ ـ ٣٠ قامة وأن ٥٪ تقع فوق أعماق تزيد عن ٣٠ / قامة في العمق .

والنسبة المئوية لنوعية رواسب القاع هي ٤٥٪ عبارة عن قاع رملي ، ٤٥٪ خليط من الرمل والطين ، ١٠٪ مغطاة بالمرجانيات .

وقد أمكن استخلاص أن المياه القطرية بها حوالي ١٥٠ نوع من الأسماك تمثل ٥٠ عائلة مختلفة . منها ١١٧ نوع من الأسماك القاعية التي تشتمل على ١١٠ نوع من الأسماك العظمية وسبعة أنواع من الأسماك الغضروفية . وأهم عائلات الأسماك القاعية هي الحمام ـ الشعرى ـ النهاش ـ فضة الشفاه ـ والماعزيات (اطلس الأسماك الشائعة في قطر ـ جامعة قطر ١٩٨١) .

وقد أظهرت الدراسة أن كمية الأسماك المصادة تزداد بزياة العمق وتقل كلما انتقلنا من الرواسب الرملية إلى الطينية الرملية إلى الطينية . وفي المواسم الحارة فان كمية الأسماك في المناطق التي يقل عمقها عن ٢٠ قامة تكون أقل منه في المواسم المعتدلة . أما في المناطق الأكثر عمقاً فان الوضع ينعكس وقد اعزى هذا إلى هجرة الأسماك إلى المناطق الأكثر عمقاً أثناء المواسم الحارة .

وقد أمكن تقدير كثافة الأسماك القاعية في المياه القطرية فوجد أنه حوالى ٢ر٧ طن/كم٢ في المتوسط وهي ما تعتبر رقماً عاليا بالمقارنة بالمناطق الأخرى في العالم ، مما يوحى بأن المياه حول قطر وخاصة الشاطىء الشرقي لها تعتبر من أغنى مناطق تواجد الأسماك في الخليج . فعلى سبيل المثال : ـ

في المنطقة المواجهة لشمال قطر وعند أعماق بين ٢٠ ـ ٣٠ قامة فان كثافة الأسماك القاعية تصل إلى ٩ر٩طن/كم٢ . أما في المنطقة المواجهة للخور وعند أعماق تزيد على ٣٠ قامة فان الكثافة تصل إلى ٦ طن/كم٢ .

وقد أمكن من هذه الدراسة تقدير أن كتلة الأسماك القاعية في المياه القطرية تصل إلى حوالي ٩٨ ألف طن تمثلها ٨٦ ألف طن من الأنواع الاقتصادية والباقي وهو ١٢ ألف طن من الأنواع غير الأقتصادية .

وقد وجد أن المنطقة المواجهة للخور تحتوي على ٢٦ ألف طن من الأسماك القاعية بين أعماق ١٠ ـ ٢٠ قامة : وأن كانت المنطقة المذكورة تحتوي في مجموعها على ٤٥٪ من جملة الأسماك القاعية في المياه القطرية .

ومن خلال الدراسة التي تمت محليا لمدة عام كامل أمكن استنتاج أن كمية الأسماك القاعية المصادة حاليا من المياه القطرية تبلغ حوالي ٢٩٠٠ طن/ سنة بالاضافة إلى نفس هذه الكمية تقريبا يتخلص منها لعدم أقبال المستهلك القطري عليها .

وعلى هذا يمكن القول أن كمية المصيد في مستواه الحالي لا يمثل خطرا على المصايد وأنه يمكن زيادة الانتاج ليعطي حوالي ١٥ ألف طن أضافية من الأسماك الاقتصادية كل عام بالاضافة إلى ألفى طن من الأنواع غير الأقتصادية .

ونظرا لأن الأسماك لا تعترف بالحدود السياسية وأن نشاط صيد الأسماك في دولة ما من دول الخليج يؤثر بلا شك على الدول الأخرى المجاورة لها .

لذلك فهذه الدراسة تدعو إلى وضع برنامج بحثى متخصص تشترك فيه الدول المتجاورة للتنسيق فيما بينها لاستغلال تلك المصايد على الوجه الأكمل . كما أن هذه الدراسة بلا شك سوف تكون عوناً أكيداً للتخطيط للصناعات السمكية في دولة قطر حتى لا تتكرر مشكلة استنزاف مصايد الربيان .