

PROJECT: FAO COPEMED

**ARTISANAL FISHERIES IN THE WESTERN
MEDITERRANEAN**

Malta Fisheries



The Department of Fisheries and Aquaculture of Malta

By:

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1. Introduction

The Maltese fishing industry may be categorised mainly in the artisanal sector since only a small number of fishing vessels, the larger ones, operate on the high seas.

The number of registered gainfully employed full-time fishermen is 374 and the number of vessels owned by them is 302.

Fish landings recorded at the official fish market in 1997 amounted to a total of 887 metric tonnes, with a value of approx. Lm 1.5 million (US\$4,000,000).

Fishing methods adopted in Malta are demersal trawling, "lampara" purse seining, deep-sea long-lining, inshore long-lining, trammel nets, drift nets and traps. The most important commercial species captured by the Maltese fleet are included as annex 1.

2. Fishing fleet

The main difference between the full-time and artisanal category is that the smaller craft are mostly engaged in coastal or small scale fisheries. The boundary between industrial and artisanal fisheries is not always well defined and with the purpose of regional standardisation the General Fisheries Council for the Mediterranean (GFCM), at its Twenty-first Session held in Alicante, Spain, from 22 to 26 May 1995, agreed to set a minimum length limit of 15 metres for the application of the "Agreement to Promote Compliance with International Conservation and Management Measures by Fishing Vessels on the High Seas" and therefore Maltese vessels over 15 m length should be considered as industrial in line with this agreement.

In 1998 the total number of licensed fishing vessels was 1792 (1475 in Malta and 317 in Gozo). Out of these 1792 vessels only 47 are considered as industrial vessels (i.e. over 15 m. length). These industrial vessels are mainly trawlers, longliners and netters. The rest of the vessels could be considered as multipurpose since they undertake all types of fishing although on a small scale. A breakdown of all licensed fishing craft as on 31st August 1998 reads thus:

Table 1: Full time vessels by type.

	Trawlers	Longliners/Netters	Luzzus	Kajjik	Others	Total
Malta	8	84	80	36	6	214
Gozo	4	34	34	14	2	88
Total	12	118	114	50	8	302

Table 2: M.F.* vessels by type.

	Trawlers	Longliners/Netters	Luzzus	Kajjik	Others	Total
Malta	1	10	10	1	-	22

* The term M.F. (Market Fisherman) denotes craft owners who undertake fishing on part-time basis but who regularly sell fish through the Wholesale fishmarket.

Table 3: Part time vessels by type.

	Trawlers	Longliners/Netters	Luzzus	Kajjik	Others	Total
Malta	1	442	168	598	30	1239
Gozo	0	39	40	140	10	229
Total	1	481	208	738	40	1468

Table 4: Full time vessels by size.

	0-8m	8.01-12.00m	12.01-15.00m	15.01-20.00m	20.01 - over	Total
Malta	121	33	30	14	16	214
Gozo	53	12	9	10	4	88
Total	174	45	39	24	20	302

Table 5: M.F*. vessels by size.

	0-8m	8.01-12.00m	12.01-15.00m	15.01-20.00m	20.01 - over	Total
Malta	7	12	3	-	-	22

* The term M.F. (Market Fisherman) denotes craft owners who undertake fishing on part-time basis but who regularly sell fish through the Wholesale fishmarket.

Table 6: Part time vessels by size.

	0-8m	8.01-12.00m	12.01-15.00m	15.01-20.00m	20.01 - over	Total
Malta	1131	96	9	1	2	1239
Gozo	217	11	1	-	-	229
Total	1348	107	10	1	2	1468

Table 7: Type of Craft by port/district (Full-time)

Malta Port/District	MPV*	Luzzu	Kajjik	Trawler	Others•	Total
M'Xlokk	49	61	18	1	4	133
St Pauls Bay	9	8	6	1	-	24
St. Julians	7	4	5	-	-	16
M'Scala	6	3	2	-	-	11
Msida	2	4	1	-	-	7
Valletta	1	-	-	4	-	5
Mellieha	3	-	1	-	-	4
Ghar Lapsi	-	-	2	-	1	3
B'Bugia	2	-	-	-	-	2
Kalkara	-	-	1	-	1	2
Marsa	1	-	-	1	-	2
Pieta	1	-	-	1	-	2
Zurrieq	1	-	-	-	-	1
Vittoriosa	1	-	-	-	-	1
Marfa	1	-	-	-	-	1
Total	84	80	36	8	6	214

Gozo Port/District	MPV*	Luzzu	Kajjik	Trawler	Others•	Total
Mgarr	28	26	13	4	2	73
M'Forn	4	7	-	-	-	11
Xlendi	2	1	1	-	-	4
Total	34	34	14	4	2	88

* MPV = Multi Purpose Fishing Vessel (Long-Lining, Netting and Lampara).

• Others = Smaller Craft used as tenders to the larger Craft.

Table 8: Type of Craft by port/district (M.F.*)

Malta Port/District	MPV*	Luzzu	Kajjik	Trawler	Others●	Total
M'Xlokk	3	5	1	-	-	9
St Pauls Bay	2	1	-	-	-	3
M'Scala	2	1	-	1	-	4
Msida	1	1	-	-	-	2
B'Bugia	2	1	-	-	-	3
Gzira	-	1	-	-	-	1
Total	10	10	1	1	-	22

- The term M.F. (Market Fisherman) denotes craft owners who undertake fishing on part-time basis but who regularly sell fish through the Wholesale fishmarket.

Table 9: Type of Craft by port/district (Part-time)

Malta Port/District	MPV*	Luzzu	Kajjik	Trawler	Others●	Total
M'Xlokk	60	59	69	-	5	193
St Pauls Bay	94	26	122	-	4	246
Marsamxett (Msida, Pieta)	59	25	78	1	8	171
B'Bugia	102	10	42	-	2	156
M'Scala	41	10	69	-	6	126
Gnejna	13	5	83	-	1	102
Mellieha	21	4	69	-	2	96
Grand Harbour (Valletta, Kalkara, Vittoriosa)	33	13	29	-	2	77
St Julians	18	14	23	-	-	55
Zurrieq	-	1	11	-	-	12
St Thomas Bay	1	1	3	-	-	5
Total	442	168	598	1	30	1239

Gozo Port/District	MPV*	Luzzu	Kajjik	Trawler	Others●	Total
Mgarr	34	27	90	-	8	159
M'Forn	3	6	26	-	-	35
Xlendi	2	7	24	-	2	35
Total	39	40	140	-	10	229

* MPV = Multi Purpose Fishing Vessel (Long-Lining, Netting and Lampara).

- Others = Smaller Craft used as tenders to the larger Craft.

Within the framework of the study of Artisanal Fisheries in the Western Mediterranean set up by the FAO-COPEMED project and during the meeting held in Malta in March 1998, experts from the eight Copemed countries (Algeria, Spain, France, Italy, Libya, Malta, Morocco and Tunisia) defined the fleets segments that should be included in this inventory. This definition comes in fact from the exclusion of what is not included in artisanal fisheries. Therefore, all the "métiers" are included in artisanal fisheries except those using the following gears:

- trawls
- big seines for small pelagic (other than those using the "lampara")
- gears targeting big pelagic (purse seines, longliners, drifnets, madragues, tuna rods, drag nets)
- hydraulic dragnets for shellfish
- big longliners (it is a speciality of Morocco but we do not know the precise criterion to distinguish between a "big" and a "small" longliner)

An important remark is that all "lampara" seine fishing is considered as an artisanal fishery.

A breakdown of the Malta artisanal fishery as it was defined by COPEMED would be:

Table 10: Artisanal fleet (Copemed definition).

	Luzzus	Kajjik	Others	TOTAL
Malta	168	598	30	796
Gozo	74	154	12	240
TOTAL	242	752	42	1036

Figures quoted in table 10 include both full-time and part-time.

The number of Multi-Purpose Fishing Vessels which fall within COPEMED artisanal fisheries are 6 which normally practice *Lampara* fishing from January to May, when Mackerel, Bogue and Horse-Mackerel are targeted. It must be noted that a considerable amount of Sardines, Anchovy and Alice Shad are regularly returned to the sea since they are not marketable in Malta.

Description of Craft

The Maltese fishing fleet is composed of two distinct types of vessels which may be categorised as modern or traditional. The traditional boats are the Luzzu and Kajjik which are distinct from modern fishing vessels both in shape, size and range of fishing activities. Whereas the modern fishing boats operate on the high seas where swordfish, tuna and large demersal species such as stone bass and various sparids are targeted due to their economic importance, the Luzzu and Kajjik are used for coastal artisanal fishing which includes small long-lines, trammel netting and traps. Whereas the Luzzu is pointed at both ends the Kajjik has a flat stern and is generally of a smaller size.

3. Fleet register

The Department of Fisheries keeps record of all full-time and part-time craft registered in all categories. The information includes:

- registration number
- name and address of the owner
- fisherman's booklet number
- national ID number of the owner
- registration file number
- type of craft (model)
- boat dimensions
- type of engine and power
- district
- radio code

In the future hold capacity and fuel capacity will be also collected.

Under the framework of the Project COPEMED and with the aim to implement GFCM Resolution 95 / 4 adopted in the 21st session of the Council (i.e. *to prepare a list of fishing boats in operation from national ports in the Mediterranean and provide this information to the GFCM Secretariat*) a database comprising vessels longer than 15 meters was provided by the Malta Fisheries Department.

4. Fishermen

On the 31 August 1998, the total registered fishing population was 1864, according to the official figures available at the Department of Fisheries. Out of these, the number of registered gainfully employed full-time fishermen was 374. Full-time is the term used for fishermen whose main income is derived solely from fishing. This number has to be seen in the context that most fishermen own more than one craft. It must be pointed out that fishing in Malta is mainly seasonal and as a consequence most full-time fishermen own at least one small and one large vessel which enable them to practice off-shore fishing during the milder seasons and coastal or inshore activities during the winter months. The average number of fishermen employed on each full-time boat is of three persons per unit during winter, whilst when undertaking trips of more than two days, extra hands are sometimes recruited.

The rest are registered as part-time fishermen whose contribution towards the industry is minimal, except for the 22 M.F. registered craft who land fish regularly at the fishmarket.

The Fisheries Department has a fishermen database that includes the following information:

- name and address
- photo,
- national Id number,
- occupation (to indicate part time or full time status of the fisherman)
- if owner, registration number of the vessel(s) with type of engine and power.

A fisheries census was undertaken in 1996. Some of the most important characteristics of the Maltese fishing population were:

- the average age of 84% of the full-time fishermen was 49 or under. 188 fishermen (55%) were under 40 years old.
- 61% of the part-time fishermen were aged 49 or less.
- There were no female full-time fishermen
- 19 females were engaged in fishing on a part time-basis.
- Most of the full-time fishermen hailed from a particular area of Malta. In fact Malta's south eastern region (including Marsaxlokk port) made up 425 of the total full-time and part-time fishing population on the Maltese Islands.
- Part-time fishing population hailing from Malta's south eastern region was a 25% of the total.

- 221 or 30% of part-time fishermen on the island of Malta (excluding Gozo) were civil service employees.

Table 11: Fishing Population (As on 31.12.96)

	Full-timers	Part-timers	TOTAL
Marsaxlokk	129	97	226
Other districts	91	1071	1162
Gozo	101	218	319
TOTAL	321	1386	1707

5. Landing sites

The main landing sites in Malta are Marsaxlokk Harbour and the wholesale fishmarket in Valletta, whilst Mgarr Harbour is the main landing site in Gozo. These are situated as follows:

Marsaxlokk	Lat. 35° 50'00"	Long. 14° 33'30"
Valletta Fishmarket	Lat. 35° 54'00"	Long. 14° 31'00"
Mgarr (Gozo)	Lat. 36° 01'50"	Long. 14° 17'00"

The main ports are as follows:

Malta

Marsaxlokk	Lat. 35° 50'00"	Long. 14° 33'30"
Marsascala	Lat. 35° 52'00"	Long. 14° 34'50"
St Paul's Bay	Lat. 35° 58'00"	Long. 14° 25'00"
Mellieha	Lat. 35° 59'00"	Long. 14° 22'50"
Zurrieq	Lat. 35° 49'00"	Long. 14° 27'50"

Gozo

Mgarr	Lat. 36° 01'50"	Long. 14° 17'00"
Marsalforn	Lat. 36° 04'20"	Long. 14° 15'50"
Xlendi	Lat. 36° 01'40"	Long. 14° 12'40"

6. Marketing and Statistics

According to fisheries regulation all fish caught by local fishermen has to be sold through the Wholesale Fishmarket in Valletta. Catches are sold by public auction through a middleman to retailers and fish hawkers. All dealers in fish are registered with the Fisheries Department.

Statistical data for fish landings is collected through the daily returns of sales submitted by middlemen at the Wholesale Fishmarket in Valletta. However this only covers sales effected in Malta since there is no such market in Gozo. It is assumed that at least 25% of all catches are not recorded for various reasons which are beyond the control of the

Fisheries Department. Changes in the fishing regulation system like the obligation of minimum catches sold to the Wholesale Fishmarket and the future surveillance of fisheries activities by maritime patrols should improve the accuracy in the near future.

The data collected in the Wholesale Market is entered in an excel sheet for processing and include:

- date,
- fisherman identification,
- voucher number,
- retailer name,
- licence number of the retailer,
- for each species: species name, number of boxes, weights and price.

These data are used to calculate monthly and annual catches by species.

7. Management

The Department of Fisheries and Aquaculture has two headquarters, the fisheries section is located in Valletta, while the aquaculture section is placed in the National Aquaculture Centre in Marsaxlokk.

The head of the Department is the Director of Fisheries and Aquaculture.

The Department has two senior fishery officers. One of these senior fishery officers, and a fishery officer under his supervision, are devoted to administrative tasks, which comprise fishery statistics, information, training, etc. The other senior fishery officer is involved in technical aspects related with fisheries as maintenance of fishing ports, fish sanitary aspects, maintenance of the cold storage room, etc.

The Fisheries Department is authorised to manage and supervise all fishing and marketing activities through Parliamentary Legislation, which empowers the Minister and the Director of Fisheries and Aquaculture to issue and update new regulations whenever necessary. The actual regulations governing local fisheries are however mostly outdated and a new Parliamentary Act catering for modern Fisheries management is being presented in Parliament for enactment.

Regulations related to the Act are submitted for Ministerial approval by an Advisory Fisheries Board which is set up every year and is composed of representatives of all branches of the Fishing Industry.

Enforcement and supervision is the responsibility of the Fisheries Department and the Maritime branch of the AFM (Armed Forces of Malta) and who, through the new act will be amalgamated under the new nomenclature of Fisheries Protection Officers whose main tasks will also include the conservation of stocks and environment

A fishing licence issued by the Director of Fisheries and Aquaculture is needed to undertake any fishing activity. Consequently every fishing vessel must be registered in

the Fisheries Department. A fisherman must also state whether his activities are going to be full or part-time.

The Department issues licences in which fishing with a particular gear for a particular species is specified..

Long-lining is undertaken in the open seas without definition of parameters.

The setting of Kannizzati (Lampuki fads), traps and ormeggios (set long-lines) is licensed in areas specified by the Department.

All fishermen pay an annual registration fee according to their category i.e. 'F' Lm5.00; 'M.F.' Lm7.50; 'P.T.F'. Lm10. No charges are levied for fishing licences.

8. Fishing Operations

Under this item Malta fisheries will be described taking in account the species targeted. The most important fisheries in Maltese waters are Bluefin tuna, dolphin fish, swordfish, demersals and small pelagics. These fisheries are operated on a seasonal basis, according to the particular targeted species' migratory behaviour.

The Department of Fisheries have this year initiated a programme of sampling by assigning one of the Department's Fisheries Officers with a full time fisherman throughout the 1998 season. In the near future samples of swordfish, dolphinfish and various demersal species will also be taken. It is expected that from this experience an in-depth analysis of the stock situation around these islands will emerge, which will undoubtedly contribute to a better understanding of the situation of the fisheries.

8.1. Bluefin tuna (*Thunnus thynnus*)

Bluefin tuna fishing season starts during the month of May and extends until July.

Fishing for Bluefin tuna has been undertaken by Maltese fishermen for a very long time. Statistics kept at the Department of Fisheries show that as early as 1920 a substantial amount of tuna were already being landed regularly during the season. However although this trend continued for a long period, the limitations of the local market and the lack of facilities to store tuna for eventual preservation made it uneconomical for fishermen to keep targeting this fish. In fact there was a period when tuna used to be imported from Italy and North Africa in just enough quantities to boost the local catches which were then derived solely from our small set nets (Tunnara) which were situated in the North of the Island. However even this activity also proved to be uneconomical and these were wound up in the 1960's due to financial difficulties. Since then and up to the 1980's, although landings of tuna were substantial, these were caught as by-catches with swordfish longlines. It must be noted that during the 70's and 80's swordfish along with dolphin fish, was the mainstay of local fishing.

The upsurge in Bluefin tuna landings came about as a result of the tapping of the Japanese market in 1989 and in fact one will find that from a mere 48,669 kilos in

1990 landings shot up to 353,014 in 1995. The decrease in landings during the last 3 seasons maybe attributed to the large presence of tuna purse seiners just off the Maltese Islands.

According to the Department of Fisheries, landings in Kg for bluefin tuna since 1980 were as follows:

	1980	1981	1982	1983	1984	1985	1986	1987	1988
Bluefin tuna	23609	32168	39804	31199	20772	21288	41202	32262	25390
	1989	1990	1991	1992	1993	1994	1995	1996	1997
Bluefin tuna	34405	48669	63311	48221	150834	343671	353014	239867	236272

In 1998 tuna were targeted by 52 Multi-Purpose Vessels ranging from 10 meters upwards involving around 150 full-time and part-time fishermen. The total landings were 244,749 kg of which 108,768 kg (45%) were exported.

The gear used is drifting surface longline (LLD) and is baited with Atlantic mackerel and /or Japanese squid. The maximum number of hooks set in a longline is 2,500 but this also depends mostly on the size of the boat. The lines are shot during the afternoon and this operation normally ends at around 8 p.m. which fishermen reckon is the prime time for the fish to bite. The lines then start being retrieved from 10.30 p.m. onwards.

Fishing is undertaken to the West, South and South East of the Island between the 35th and the 36th parallels within the following parameters; on the Western Limit Lat. 35°52'00" Long. 13°30'00" (50 miles from Marsaxlokk to the South Extremity Lat.. 35°21'58" Long. 14°25'24", (30 miles from Marsaxlokk, to the South East . Lat. 35°22'74" Long. 15°03'14" (37 miles from Marsaxlokk) which covers approximately 2,000 sq. miles. [see map annexed]. At the beginning of the season, May, the effort is undertaken mainly in the Southwest area of the region and consequently further to the East according to the normal movement of the Bluefin tuna. The season ends in July.

The main landing zones are Marsaxlokk, St. Paul's Bay and Marsascala harbours in Malta, whilst those in Gozo are Mgarr and Marsalforn harbours (see map above).

8.2. Dolphinfish (*Coryphaena hippurus*)

The dolphinfish (*Coryphaena hippurus*) season extends from September to November.

Dolphinfish or lampuka (in Maltese) is one of the most important species for the economy of the Maltese fishing industry. In fact up to a few years ago it was actually the most important fishery due to its appeal to the public and the abundance of catches which regularly occur each year.

During the eighties an effort was made to introduce dolphinfish in the European market, but although first results were encouraging subsequent requests for this fish were not deemed viable enough to be of further interest for the local fishing community.

Due to its traditional appeal all boat owners participate in this seasonal activity and for this reason it was found necessary to involve the Department of Fisheries in organising and managing all activities.

During the month of May, all boat owners whose craft is longer than 6 metres are invited to submit applications for the allocation of a fishing site. When all applications have been received, these are apportioned into different ports/districts. Subsequently all applicants from each district will draw lots for the allocation of a fishing site, with preference being given to full-time fishermen. A licence for using a particular fishing site is then issued by the Department of Fisheries. This licence carries the conditions that it is: (i) non-transferable; (ii) the applicant will use only one licensed boat, (iii) all fish caught to be sold through the Wholesale Fish Market, (iv) each licensee shall lay at least 35 kannizzati (FADs) in a straight line along the way points indicated by the Department. Those fishermen who do not adhere to these conditions will automatically forfeit the right to apply the next year.

This year 98 sites were allotted all around the island except for the corridor having the following parameters SSC lat. 35°41'30" long. 14°37'00" and SE lat. 35°47'24" long. 14°45'12" which is kept free from lampuki fads so that swordfish fishing can be undertaken. The sites start from 7 miles offshore at intervals of one half or three quarters of a mile depending on the district. The total number of boats involved is 111 of which 84 belong to Maltese fishermen whilst the rest belong to Gozitan fishermen. The approximate number of fishermen employed in this fishery is around 550.

According to the Department of Fisheries landings in kilos for dolphinfish and bycatch species are shown hereunder:

	1980	1981	1982	1983	1984	1985	1986	1987	1988
Dolphin fish	248727	177243	401482	441054	565623	464167	367677	349328	275580
Pilot fish	107120	55262	205792	81094	35833	130269	219272	463288	66205
Amberjack					415				
	1989	1990	1991	1992	1993	1994	1995	1996	1997
Dolphin fish	314055	259640	304208	187861	174053	333595	333725	306564	295225
Pilot fish	43643	6835	17608	48915	71754	28658	12702	6694	4460
Amberjack	4436		2771	2418		329	4323	8632	5970

Dolphinfish are captured using "fish aggregating devices"(FAD's). These FAD's are small rafts made of floating material, which are then anchored to the bottom. They were introduced after it was noticed that dolphinfish along with other species such as the pilot fish (*Naucrates ductor*) and the amberjack (*Seriola dumerili*) tend to aggregate within the canopy of shadow that these floats make. To further augment the number of fish palm fronds are attached underneath each float. Once the dolphinfish are aggregated, they are caught by surrounding nets similar to a purse-seine. When the boat is near a FAD various trolls made out of feathers or artificial bait are set and when one fish is caught, a decoy dolphinfish is thrown into the sea to attract any others that may be present under the FAD. When the number of fish present makes it worthwhile, the surrounding operation is then undertaken.

8.3. Swordfish (*Xiphias gladius*)

Swordfish (*Xiphias gladius*) is targeted throughout the year although in varying degrees and for different reasons. The peak period is from late June to August when other boats revert from tuna to swordfish fishing prior to starting operations for dolphinfish from September onwards.

From the Department's earliest records (1920 onwards), one can attest that swordfish was already being caught by Maltese fishermen, albeit in small quantities, although it is not clear what gear and methods were in use then. However swordfish started making a big impact on local fisheries from 1968 onwards and with the opening of foreign markets, particularly Italy, the effort was increased. Another factor which helped towards this upsurge in landings was the introduction of Atlantic mackerel as bait, which substituted the live bait which was previously used and which incidentally consisted of sardines and anchovy.

Swordfish landings started going beyond the 100 MT mark in 1969 due to the reasons commented above, and during the seventies catches sometimes exceeded 200 MT. Swordfish landings reached again the seventies levels in 1980, but for various reasons this figure went down to 119 MT in 1991 and still less in 1996-97 MT. 1997 landings totalled 83 MT. The main reason for the downward trend is not only that the presence of swordfish is diminishing through over fishing by both local and foreign fishermen, but because there has been a pronounced shift to Bluefin tuna fishing during May, June and July to meet the demands of newly found foreign markets particularly Japan. However, in spite of this important decline, swordfish still have an important economic role and represent a constant 7% of the total annual effort.

Landings of swordfish according to the statistics of the Department of Fisheries and Aquaculture of Malta are as shown below:

	1980	1981	1982	1983	1984	1985	1986	1987	1988
Swordfish	197882	170905	158079	53014	83551	96010	86693	123585	184731
	1989	1990	1991	1992	1993	1994	1995	1996	1997
Swordfish	107820	108879	105556	70648	75516	42155	58191	57659	82979

Actually only about 10 MPVs are equipped solely with swordfish longlines, the rest adapting their gear according to different seasonal fisheries such as swordfish, tuna and dolphin fish. During the peak period as many as 50 to 60 boats may actually target swordfish and this involves between 200 and 250 fishermen.

The only gear used for swordfish is surface drifting longlines (LLD) and the number of baited hooks varies according to the boat's size and range. Thus the larger boats which venture beyond 25 miles and remain at sea for at least 5 days may set as many as 2,000 hooks at any time, weather permitting, whilst the smaller craft spend a maximum of 3 days at sea and set between 500 and 700 hooks per effort.

The fishing technique is identical to that used for tuna. The bait is exclusively Atlantic mackerel and the size of each mackerel varies according to the period when different

sizes of fish are anticipated, that is during the period when juvenile swordfish are present the hooks are baited with smaller mackerel.

Although swordfish can be found all around the Maltese Islands, the main effort is always to the South for the following reasons:

- a) the zone to the North is shared with Sicilian fishermen and consequently the area is limited to a maximum of 20/25 miles offshore;
- b) the Northern zone known as the Malta Channel is nearly always full of other traffic which constitutes a constant hazard;
- c) since the main fishing port, Marsaxlokk is situated in the South East of the island it is more economically viable to operate in the southern zone. Also the area has almost unlimited boundaries towards West, South and East, and is less congested;
- d) also during the dolphin season when "kannizzati floats" -FAD's-are set all around the Island, an exception is made in part of the Marsaxlokk District where a 20 mile wide corridor is left free of FAD's so that swordfish fishing can be undertaken, thus making this particular stretch of sea an extra zone during the autumn and early Winter months. The two sides of this corridor have the following co-ordinates: SSE Lat. 35°41'30" Long 14°37'00" and SE 35°47'24"/14°45'12". Further to the South and West the area exploited by these fishermen is roughly bounded by the following co-ordinates on the West and East and along the 35th parallel to the Southwest: West Lat. 35°50'00"/Long. 13°30'00"; East Lat. 35°50'00"/Long. 15°30'00", and along the 35th Parallel to the South [see map annexed].

It should be noted that during the summer months, the larger boats set their lines at least 50 miles to the south of the Maltese islands.

8.4 Demersal species

Demersal fishing is undertaken with different types of gears: gillnets and entangling nets, bottom trawlers, longliners and traps.

8.4.1 Gillnets and entangling nets

Different types of bottom gillnets and entangling nets are used in the Maltese Islands. These are : a) trammel net (GTR) locally known as Parit; b) the Xkitt (GTN) which is a compound net; c) Xkatlar, a single mesh bottom net (GNS). They are mainly used during the winter months when the weather does not allow long term fishing on the high seas. These gears are used both day and night depending on the particular species being targeted, eg demersal species late evening and night, pelagic species during the day. The product is commercialised fresh and is for local consume.

The use of nets has been practised since time immemorial and their importance started diminishing through the introduction of long-lining which permits fishing away from the shore in deeper waters.

Licenses are normally issued only to bona fide full-time fishermen.

- a) Trammel nets (GTR). These nets are bottom set nets consisting of three walls of netting, the two outer walls have a mesh size of 140 mm knot to knot, whilst the central net has a constant 22 or 28 mm mesh. Species caught with this type of net include red and striped mullets (*Mullus barbatus* and *Mullus surmuletus*), and species belonging to the family Sparidae (*Pagellus* spp., *Oblada melanura*, *Pagrus pagrus*, etc.) and Scorpaenidae (*Scorpaena* spp.). The main effort is undertaken in internal waters along the coast where depth varies from 20-80 m. The terrain varies from posidonia meadows to rocky and sandy areas.
- b) Combined gillnets-trammel nets (GTN). This type of gear is composed by two different gears. A single gillnet is above a trammel net so that along with species caught by normal trammel nets, mid-water species such as bogue (*Boops boops*) and scad (*Trachurus mediterraneus*) are also caught. The main fishing area is to the north part of the island, at 10-40 m. bottoms. These activities are undertaken by approximately 150-200 vessels in the smaller category, such as Luzzus, Kajjiks and Multi purpose vessels (MPV) which are less than 12 m length. These boats are usually manned by 1 or 2 fishermen. Landings for bogue are shown below (includes also bogue fished with other gears)

	1980	1981	1982	1983	1984	1985	1986	1987	1988
Bogue	90964	142916	101729	107641	132580	124884	92528	101655	128270
	1989	1990	1991	1992	1993	1994	1995	1996	1997
Bogue	106502	81906	2340	46332	42728	19054	18921	16600	15875

- c) Bottom nets (GNS). They are single mesh nets mm which are used specifically to catch Elasmobranchii, mainly dogfish (*Squalus acanthias*), skates and rays (*Raja* spp.), angel shark (*Squatina squatina*). They are used also to target lobsters (*Palinurus elephas*).

8.4.2. Bottom trawling

Due to the complexity of the local market trawling is also seasonal, in the sense that certain species fetch good prices at particular periods of the year.

In actual fact, three different types of trawling activities are undertaken during the year:

- a) Deep sea trawling (during the day) in 600 m and over, where king prawns (*Aristeus antennatus*) are targeted. When fishing king prawns there is almost no by-catch, except for small marketable by-catches of forkbeard (*Phycis blennoides*) and common sole (*Solea vulgaris*). King prawns are found in depths of over 500 meters throughout the year at all hours of the day since daylight does not penetrate that depth. They are found in an area about eight miles to the North West of Malta within the following parameters: Lat. 36°10'03"/Long. 13°54'86" and Lat. 36:13'97"/Long. 13°59'40" at the Northern extremities whilst the Southern part has the following co-ordinates Lat. 36°03'72"/Long. 14°01'80" and

Lat. 36°08'77"/Long. 14°06'66" [see map annexed]. Since the terrain is composed of mud or clay, and free from obstacles, the duration of each trawl is at least 4 hours, consequently advantage is taken of the long daylight in the summer as at least 3 trawls a day can be undertaken.

- b) Trawling in depths of between 150/200 m, (during the day) where the terrain is mainly mud and clay yields shrimps (*Parapenaeus longirostris*), hake (*Merluccius merluccius*), red mullet (*Mullus surmuletus* and *Mullus barbatus*), octopus (*Octopus vulgaris*), japanese squid (*Todarodes sagittatus*), cuttlefish (*Sepia officinalis*) and marketable by-catches of dogfish (*Squalus acanthias*), spotted dogfish, skate and rays (*Raja spp.*), bogue (*Boops boops*) and scad (*Trachurus mediterraneus*). These species are fished very close to land (3/4 miles). This activity is mainly carried out in winter, when the weather does not allow to fish in deeper waters.
- c) Trawling at night in depths of between 100 and 200 meters where the bottom is hard and rocky, yields red mullet, comber (*Serranus spp.*), Pandora (*Pagellus spp.*), squid, cuttlefish and weaver (*Trachinus spp.*). This type of trawling is undertaken all along the Northern side of the island but the main zone is on and around Hurd Bank where stocks are more abundant (see map). Trawl time can never be longer than one hour, since the rough terrain will put too much strain on the trawl nets and damage them. This allows for several trawls to be carried out during the dark.

In all cases the nets used are the Mazara type otter trawls (OTB) which are adjusted according to the type of terrain in which operations are being conducted.

Landings of the most important demersal species fished with trawlers are shown below (source: Department of Fisheries and Aquaculture of Malta). Natantian decapods are recorded as a single group, statistics by single species are not available.

	1980	1981	1982	1983	1984	1985	1986	1987	1988
Hake	39857	16648	15363	9638	12089	7212	8963	11055	7224
Natantia	7636	16045	8661	6051	35744	35626	20338	24314	13611
Red mullets	7300	11829	10350	8136	12266	7895	7413	6171	5747
	1989	1990	1991	1992	1993	1994	1995	1996	1997
Hake	8606	3881	1555	715	629	551	1377	2475	3583
Natantia	21324	10486	6771	4070	6426	3585	4833	9112	16454
Red mullets	16471	6705	291	1235	1682	2495	3909	6849	7227

There are twelve licensed bottom trawlers in Malta involving about 80 seamen. They operate in areas well within the 25 mile fishing limit, mainly due to the availability of good trawling grounds quite near to the coast. Trawling is undertaken both during the day or night for purely operational reasons.

8.4.3. Bottom longlining

Breams (*Pagellus spp.*), dentex (*Dentex dentex*), wreckfish (*Polyprion americanus*), stone bass (*Epinephelus alexandrinus*) and common sea bream (*Pagrus pagrus*) are the main targeted species for this type of fishery that is undertaken in areas well away from shore.

The gears used are bottom set longlines (LLS). Usually these longlines are set in deep rocky areas near the slope, at depths of 200 m. or more.

According to the size of species targeted we can state that two different demersal set longlines are used in Malta. The main difference among these longlines are the hook size. These fisheries are the following:

- a) Pandora, dentex and common sea bream are the main targeted species. This fishery is seasonal, and takes place mainly between the periods January-May, and August-October. The product is consumed mainly in Malta but there are also some exports. Vessels are usually bigger than 10 m length. Approximately 20 vessels are engaged in this fishery. Bottom set longlines. Number of fishermen that are engaged in this fishery are 60 approximately.
- b) Wreckfish and stone bass are the main targeted species. Also seasonal, picking up in January-May and July-October. Locally consumed but there are also some exports. Approximately 10 vessels bigger than 10m length are involved in this fishery. Bottom set longlines. Number of fishermen that are engaged in this fishery are 30 approximately.

Unfortunately due to reluctance on the part of fishermen no exact zoning in relation to these activities are presently available.

Landings of these species according to the statistics of the Department of Fisheries and Aquaculture of Malta are as shown below:

	1980	1981	1982	1983	1984	1985	1986	1987	1988
Pandora	6171	11789	6382	5532	4775	13756	2610	2367	3363
Wreckfish & Stone bass	15810	16567	20091	31212	34060	32751	35460	23297	19868
	1989	1990	1991	1992	1993	1994	1995	1996	1997
Pandora	4180	2982	2932	949	1554	1240	2799	4504	5526
Wreckfish & Stone bass	57672	30224	24379	23028	28708	15696	22527	27758	40828

8.4.4. Traps

Traps (FPO) are used to catch a wide range of demersal species and are constructed in different shapes and sizes according to the species being targeted. The material used to construct these traps also varies according to species. For species such as moray eel (*Muraena helena*), octopus (*Octopus vulgaris*) and lobster (*Palinurus elephas*) the material used is chicken wire netting, whilst for bogue (*Boops boops*), picarel (*Spicara smaris*) and similar species the material used is cane cut into fine strips or special reeds which are imported from North Africa. Shapes vary according to the migratory habits

of the targeted species, meaning that for bottom hugging species the shape would be rectangular, whilst oval or round shaped traps are used for mid-water species. Approximately there are 180-200 vessels using traps, being these vessels always of the kajjik and small luzzus type, with length under 10 m. The number of fishermen per boat varies among 1 and 2. The product is always consumed locally and sell as fresh fish.

As we say before it can be considered that there are three different types of traps in Malta:

- a) Benthonic species as moray, octopus and lobster are fished with rectangular metallic traps. They are set all the year round in bottoms ranging from 30 to 70 m depth. They are present in all ports.
- b) Those used for fishing picarel are bottom wooden traps, oval or round shaped. They are only used in Gozo. They are set at depths ranging from 50 to 70 m during the late winter and spring season.
- c) The traps used for bogue have a peculiar oval shape and are set at a distance of 1 m from the bottom, at 20-40 m depth. The material used to construct theses traps is wood. This fishery is practised all year round. They are present in all ports.

8.5. Pelagic species

8.5.1 Lampara

Coastal pelagic fishing in the Maltese Islands has been practised for a very long time and at least from 1930 when "lampara" fishing was first introduced locally and up to a few years ago it was very important part of the total national fishing effort when landings of chub mackerel (*Scomber japonicus*), atlantic mackerel (*Scomber scombrus*), horse mackerel (*Trachurus trachurus*), scad (*Trachurus mediterraneus*), bogue (*Boops boops*), allice shad (*Alosa alosa*), pilchard (*Sardina pilchardus*) and anchovy (*Engraulis encrasicolus*) were quite abundant and in fact use to constitute 30% of the total fishing effort, but since the 60's the effort became minimal and subsequent catches are insignificant.

The main importance of sardines and anchovy in particular was because they were bought by fishermen to use as bait. Also, before the advent of large scale targeting of swordfish and tuna and the introduction of demersal species such as hake and red mullet on a large scale, the local market use to absorb all the catches, especially chub mackerel, which was then, along with the dolphin fish, one of the most sought after species.

At present only six purse seiners based in Marsaxlokk (Malta) and Mgarr (Gozo) undertake this fishery with the main targeted species being the chub mackerel which is still marketable to a certain degree. That the presence of anchovy and sardines in Maltese waters is quite abundant can be attested from the fact that a considerable amount of these species are returned to the sea regularly.

They are fished with "lampara" seines (LA). The term "lampara" is used because fishermen use strong lights to attract fish, which are then caught by purse seining. The

boats used for this fishery are in the 10-15 meters length category. The purse seine is between 400 to 450 meters long and about 105 meters high. The size of the mesh is a constant 23 mm knot to knot. (See metiers information)

"Lampara" fishing takes place all along the North side of the island but the main zone is around a shallow area covering about 5 square miles, known as Hurd bank and which is situated within the following parameters: North extremities; Lat. 35° 53' 00" Long. 14° 44' 50" and Lat. 35° 54' 00" Long. 14° 48' 00". South extremities; Lat. 35° 52' 00" Long. 14° 45' 00" and Lat. 35° 53' 00" Long. 14° 48' 00"[see map annexed].

The depth is between 35 and 44 meters with the intermediate area descending to a maximum of 100 meters.

"Lampara" fishing is undertaken throughout the year except for the period from September to December when these boats target the dolphin fish. Although catches are more or less constant, the peak period is during May.

According to the statistics of the Department of Fisheries and Aquaculture of Malta landings of pelagic species are as shown below:

	1980	1981	1982	1983	1984	1985	1986	1987	1988
Mackerel	2674	5321	3429	2023	5966	10586	9402	1348	1454
Horse mackerel	85406	69448	54531	35802	42515	29053	57979	40986	20471
Alice shad	3454	1324	4136	3941	4292	1346	4240	3284	385
	1989	1990	1991	1992	1993	1994	1995	1996	1997
Mackerel	2703	2982	2887	9765	10174	9785	12845	23442	28932
Horse mackerel	10238	21891	5049	6799	5919	5060	7511	4798	3591
Alice shad	41	62	525	317	45				

8.5.2 Ormeggio (Shark Fishery)

The word is Italian for berth. It is used locally to indicate where strong surface set longlines (LLS) are anchored and baited with chunks of meat or pieces of large fish to attract sharks (*Squalus acanthias* and *Prionace glauca*). However other types of sharks are caught either directly or by means of bottom long lines or as by-catch during other activities.

This fishery is conducted in the south part of Malta and in the Southwest of Gozo all year round.

Dogfish are the main targeted species for this type of fishery that is operated with surface set longlines. The main season for this fishery is from November to May. Approximately 20 vessels bigger than 10m are engaged in this fishery. The number of fishermen that operate in this fishery are 60 approximately. The product is consumed fresh and consumed locally.

Landings of dogfish (*Squalus acanthias*) according to the statistics of the Department of Fisheries are:

	1980	1981	1982	1983	1984	1985	1986	1987	1988
Dogfish					54340	56274	43640	34446	31738
	1989	1990	1991	1992	1993	1994	1995	1996	1997
Dogfish	41730	3567	20754	26147	32740	29102	23563	28352	28320

8.5.3 Driftnets

The maltese name for these gears is l-Gholi. These nets are small pelagic nets (GND) used mostly from November to February when saddled bream (*Oblada melanura*) and small tunids (*Scombridae*) are known to congregate. The size of the meshes varies according to the species, which means that for the in particular areas along the coast of the Maltese islands *Oblada melanura*, which is the smaller of the targeted species. Approximately 50 small vessels are licensed to use this gear.

Annex 1. List of species

Scientific name	Maltese	English	FAO English
<i>Alosa alosa</i>	Lacca	Allice shad	Allis shad
<i>Anguilla anguilla</i>	Sallura	Common eel	European Eel
<i>Aristeus antennatus</i>	Gamblu homor	King prawn	Blue and red shrimp
<i>Auxis thazard</i>	Tumbrell	Frigate mackerel	Frigate tuna
<i>Boops boops</i>	Vopa	Bogue	Bogue
<i>Centrophorus granulosus</i>	Zaghrun	Rough shark	Gulper shark
<i>Conger conger</i>	Gringu	Conger eel	European conger
<i>Coryphaena hippurus</i>	Lampuka	Dolphin fish (Dorado)	Common dolphinfish
<i>Dentex dentex</i>	Dentici	Dentex	Common dentex
<i>Dicentrarchus labrax</i>	Spnotta	Bass	European seabass
<i>Epinephelus alexandrinus</i>	Dott	Stone bass	Golden grouper
<i>Epinephelus guaza</i>	Cerna	Grouper	Dusky grouper
<i>Euthynnus alletteratus</i>	Kubrita	Little tuny	Little tunny
<i>Eutrigla gurnardus</i>	Gallina	Grey Gurnard	Grey gurnard
<i>Heptranchias perlo</i>	Murruna	7-gilled shark	Sharpnose sevengill shark
<i>Hexanchus griseus</i>	Murruna	6-gilled shark	Bluntnose sixgill shark
<i>Lamna nasus</i>	Pixxiplamtu	Porbeagle shark	Porbeagle
<i>Loligo vulgaris</i>	Klamaru	Squid	European squid
<i>Merluccius merluccius</i>	Merluzz	Hake	European hake
<i>Mugil spp., Liza spp.</i>	Mulett	Mulletts	Mulletts
<i>Mullus barbatus</i>	Trilja tal-qawwi	Red mullet	Red mullet
<i>Mullus surmuletus</i>	Trilja tal-hama	Striped mullet	Striped red mullet
<i>Muraena helena</i>	Morina	Moray	Mediterranean moray
<i>Naucrates ductor</i>	Fanfru	Pilot fish	Pilot fish
<i>Nephrops norvegicus</i>	Ksampu	Norway lobster	Norway lobster
<i>Oblada melanura</i>	Kahlja	Saddled Bream	Saddled seabream
<i>Octopus vulgaris</i>	Qarnita	Octopus	Common octopus
<i>Pagellus bogaraveo</i>	Pagella tal-gargi	Red bream	Blackspot seabream
<i>Pagellus erythrinus</i>	Pagella hamra	Pandora	Common pandora
<i>Pagrus pagrus</i>	Pagru	Common sea bream	Common seabream
<i>Palinurus elephas</i>	Awwista	Lobster	Common spiny lobster
<i>Parapenaeus longirostris</i>	Gamblu bojot	Shrimp	Deep-water pink shrimp
<i>Phycis blennoides</i>	Lipp abjad	Grater forkbeard	Grater forkbeard
<i>Plesionika spp.</i>	Gamblu roza	Shrimp	Arrow, Golden, Striped Soldier shrimp
<i>Polyprion americanus</i>	Dott/Hanzir	Wreckfish	Wreckfish
<i>Prionace glauca</i>	Huta Kahla	Blue shark	Blue shark
<i>Raja spp.</i>	Rajja	Ray	Skates and Rays
<i>Sardinella aurita</i>	Lacca tal-faxx	Gilt sardine	Round sardinella
<i>Sarpa salpa</i>	Xilpa	Salema	Salema
<i>Scomber japonicus</i>	Kavall	Mackerel	Chub mackerel
<i>Scorpaena scrofa</i>	Cippullazza	Largescaled scorpion-fish	Red scorpionfish
<i>Scorpaena porcus</i>	Skorfna sewda	Smallscaled scorpion-fish	Black scorpionfish
<i>Sepia officinalis</i>	Sicca	Cuttlefish	Common cuttlefish
<i>Seriola dumerili</i>	Accola	Amber jack	Greater amberjack
<i>Serranus cabrilla</i>	Sirrana	Comber	Comber
<i>Sparus aurata</i>	Awrata	Gilthead bream	Gilthead seabream
<i>Sphyrna zigaena</i>	Kurazza	Hammerhead	Smooth hammerhead
<i>Spicara smaris</i>	Arznella	Picarel	Picarel
<i>Squalus acanthias</i>	Mazzola	Dog fish	Picked dogfish
<i>Thunnus thynnus</i>	Tonn	Bluefin tuna	Northern Bluefin tuna
<i>Todarodes sagittatus</i>	Tothu	Japanese squid	European flying squid
<i>Trachurus mediterraneus</i>	Sawrella	Scad	Mediterranean horse mackerel
<i>Trachurus trachurus</i>	Sawrella kahla	Horse mackerel	Atlantic horse mackerel
<i>Xiphias gladius</i>	Pixxispad	Swordfish	Swordfish
<i>Zeus faber</i>	Pixxi San Pietru	John dory	John dory

