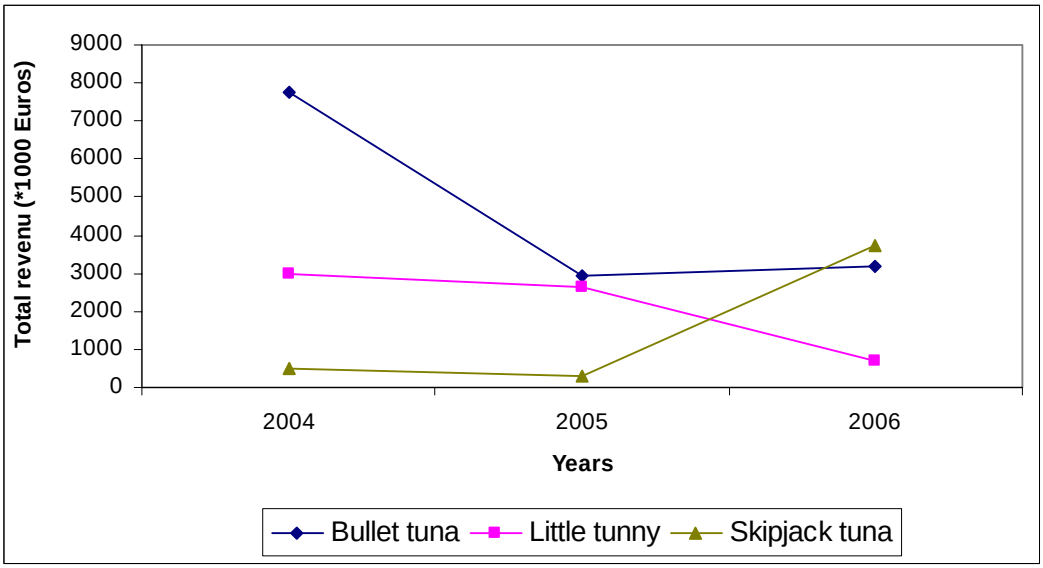

Figure 81 – Total revenue (values in 1 000 euros) estimated for bullet tuna, little tunny and skipjack – Mediterranean sea area (all countries together), from 2004 to 2006

The economic relevance of the small tuna species fisheries appears quite important from this first estimation exercise, taking into account that to the assessment should be considered a very prudential one, due to the many uncertainty factors which create an effective underestimation of the possible status of these fishing activities in the Mediterranean and Black Seas.

It is important to underline that, besides of the lack of several data and information, it appears quite clear that when combined these fisheries have high economic relevance for Mediterranean and Black Sea countries, certainly comparable with other much more well-known fisheries for other species.

4.4 Socio-economic indicators for small tuna fisheries

One of the preliminary goals of this report was to find some socio-economic indicators, able to define the relevance of these fisheries better. Despite the various efforts to obtain data useful for this exercise from both official sources and from the region's scientific community working in various research institutes in many Mediterranean countries, it has proved impossible to disentangle the existing information from the rest of the fisheries. Indeed the basic information, when and where it exists, is mixed up together with other components of the small scale fishery or with other segments of the fleets.

Only the future implementation of an approach to data collection by "métier" and related segments might allow for the improved identification of the data required to distinguish the various aspects of these fisheries.

The fact that these fisheries were considered for a long time as just a sort of traditional subsistence activity, able to partially support the needs of several coastal communities along the shores of the Mediterranean and Black Seas, alone substantiates the fact that these fisheries have a certain socio-economic relevance throughout the area.

More specific effort is needed to define these fisheries, including the economic and socio-economic aspects. Métier-based data collection approach, field surveys and dedicated pilot studies are useful tools to be used to improve the understanding of these fisheries immediately.

5. DISCUSSION

It is very clear, from what has been reported in the previous chapters, that much knowledge does not yet exist about the fishery of small tuna species in the Mediterranean and the Black Seas. While some situations are getting better and data are generally improving, others appear still undefined.

The landing data represent one of the points where an improvement is necessary. As has been pointed out several times in the report, there are a number of factors affecting the reliability of the landing data. It is certain that not all the countries are declaring their catches of small tuna species and it is strongly suspected that several others are under-estimating or under-reporting their catches. This is mostly due to the low consideration given to this fishing activity, which is not believed to be relevant in terms of production and

annual revenues. As we reported in the previous chapters, this is far from the reality and these fisheries are quite significant.

An overview of the species reported by countries to ICCAT is provided in Table 30.

Table 30 – Details of the Countries reporting catches of small tuna species from the Mediterranean and the Black Sea to ICCAT

COUNTRY	GFCM	ICCAT	reported catches to ICCAT						
	member	member	BON	LTA	FRI	BLT	SKJ	BOP	TUN
Albania	X	X							
Algeria	X	X							
EC-Bulgaria*	X	X							
Croatia	X	X							
EC-Cyprus*	X	X							
European Community	X	X							
Egypt	X	X							
EC-France*	X	X							
Georgia									
Gibraltar**									
EC-Greece*	X	X							
Israel	X								
EC-Italy	X	X							
Japan***	X	X							
Lebanon	X	X							
Libya	X	X							
EC-Malta	X	X							
Monaco	X								
Montenegro°	X								
Morocco	X	X							
Palestinian Territories									
EC-Portugal***		X							
EC-Romania	X	X							
Russia		X							
EC-Slovenia	X	X							
EC-Spain	X	X							
Syria	X	X							
Tunisia	X	X							
Turkey	X	X							
Ukraine									
NEI (unclassified)									
Former Countries									
Yugoslavia									
U.S.S.R.									

NOTES: *Represented in ICCAT by the EC; ** Belonging to UK (EC); ***Country fishing in the Mediterranean even if not coastal;° formerly Serbia and Montenegro .

Note: Libya = Libyan Arab Jamahiriya
Syria = Syrian Arab Republic
USSR = the former Union of Soviet Socialist Republics

According to ICCAT, five out of 29[4] countries or entities are not reporting any catch of small tunas. Among the others, six of them had sometimes reported catches in the past for a single species. Therefore 17 percent are not reporting catches and 21 percent had sometimes reported the catches of one species only; this result in 38 percent of the countries not reporting their catches of small tuna species, except for some years and for one species only. This is an important point to be taken into account when assessing the real situation of these fisheries.

Due to the fact that the FAO[5] statistics were used to describe the fishery of these species (chapter 3 of this report) and that EUROSTAT statistics were used to describe the economics of these fisheries, it is useful to complete the overview with the ICCAT statistics. Indeed the fishery of all these species must be reported to ICCAT by all member States (21[6] out of 29) and so it is quite relevant to show which data were provided by the statistical services of the various states to the well-established ICCAT data bank.

The total catches reported to ICCAT are shown in Figure 82. These include the reported catches of Atlantic bonito, bullet tuna, frigate tuna, little tunny, skipjack, plain bonito and undefined tunas including the small tuna species (*Thunnini*).

The average catch over the entire period of 57 years (1950–2006) is about 28,108 tons, quite a relevant amount when considering that they range from 653 to 78 037 tonnes per year.

Figures 83 and 84 show all catches one by one by species, as they are reported to ICCAT.

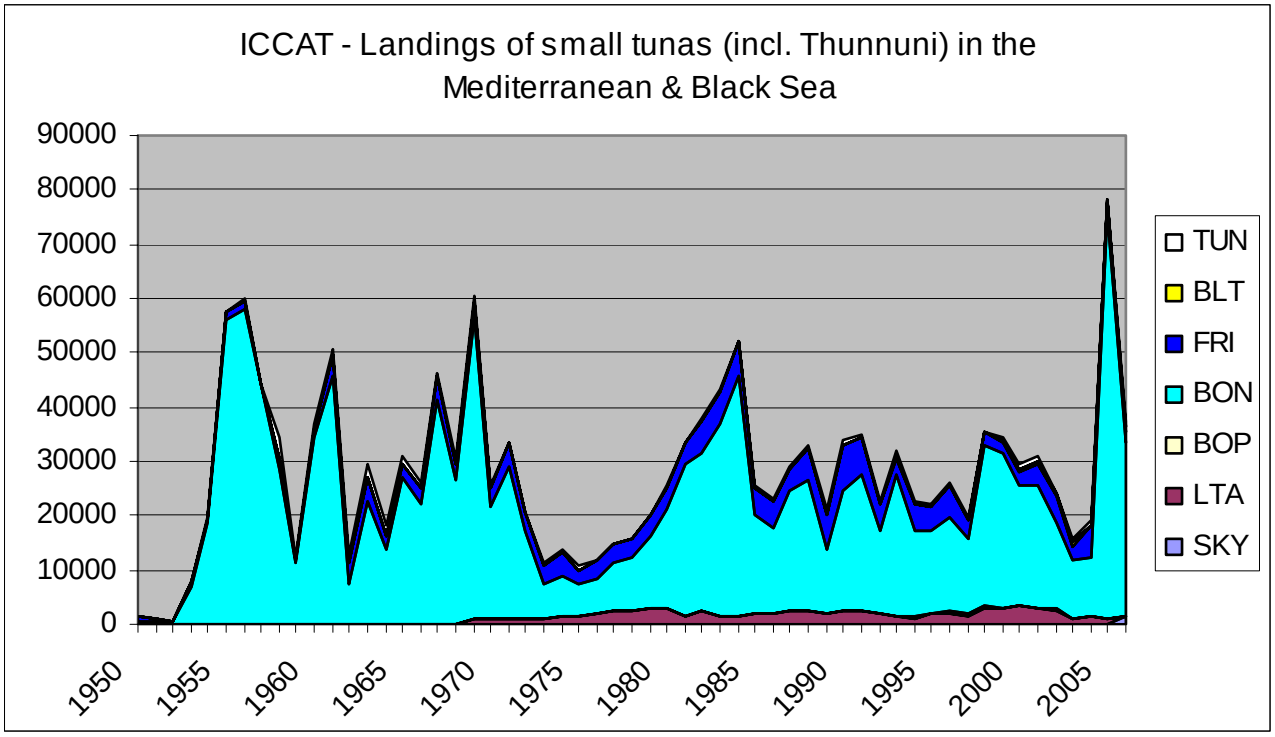

Figure 82 – Total cumulated catches by species in the Mediterranean and the Black Seas, as they are reported by the countries to ICCAT from 1950 to 2006

[4] The European Community is not taken into account in this calculation, because catches are individually reported by EU Countries.
[5] 24 out of 30 Countries or entities are members of the GFCM.
[6] Among them, 10 are EU Countries, plus Gibraltar.

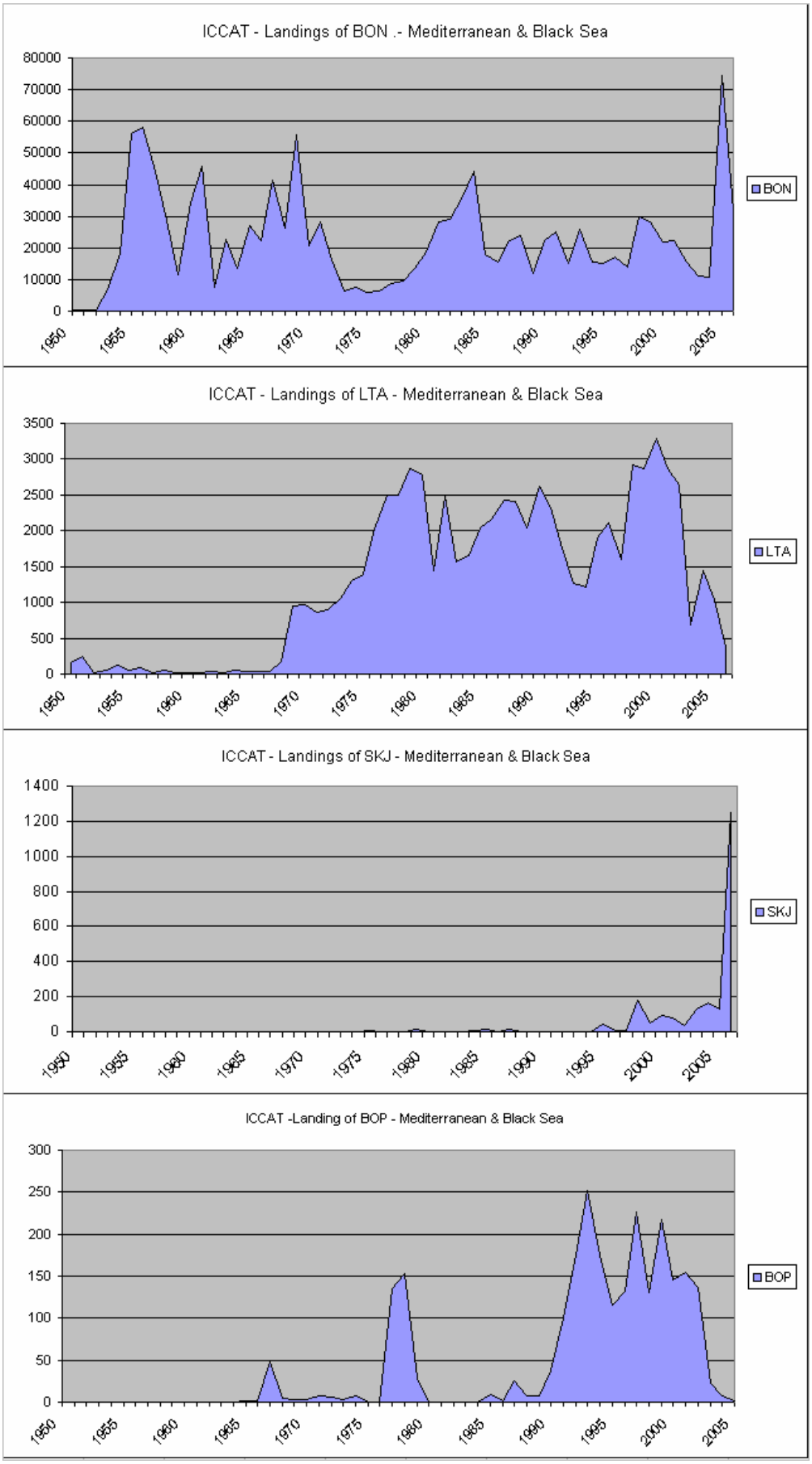

Figure 83 – Total catches of Atlantic bonito (BON), little tunny (LTA), skipjack (SKJ) and plain bonito (BOP) in the Mediterranean and the Black Seas, according to ICCAT from 1950 to 2006

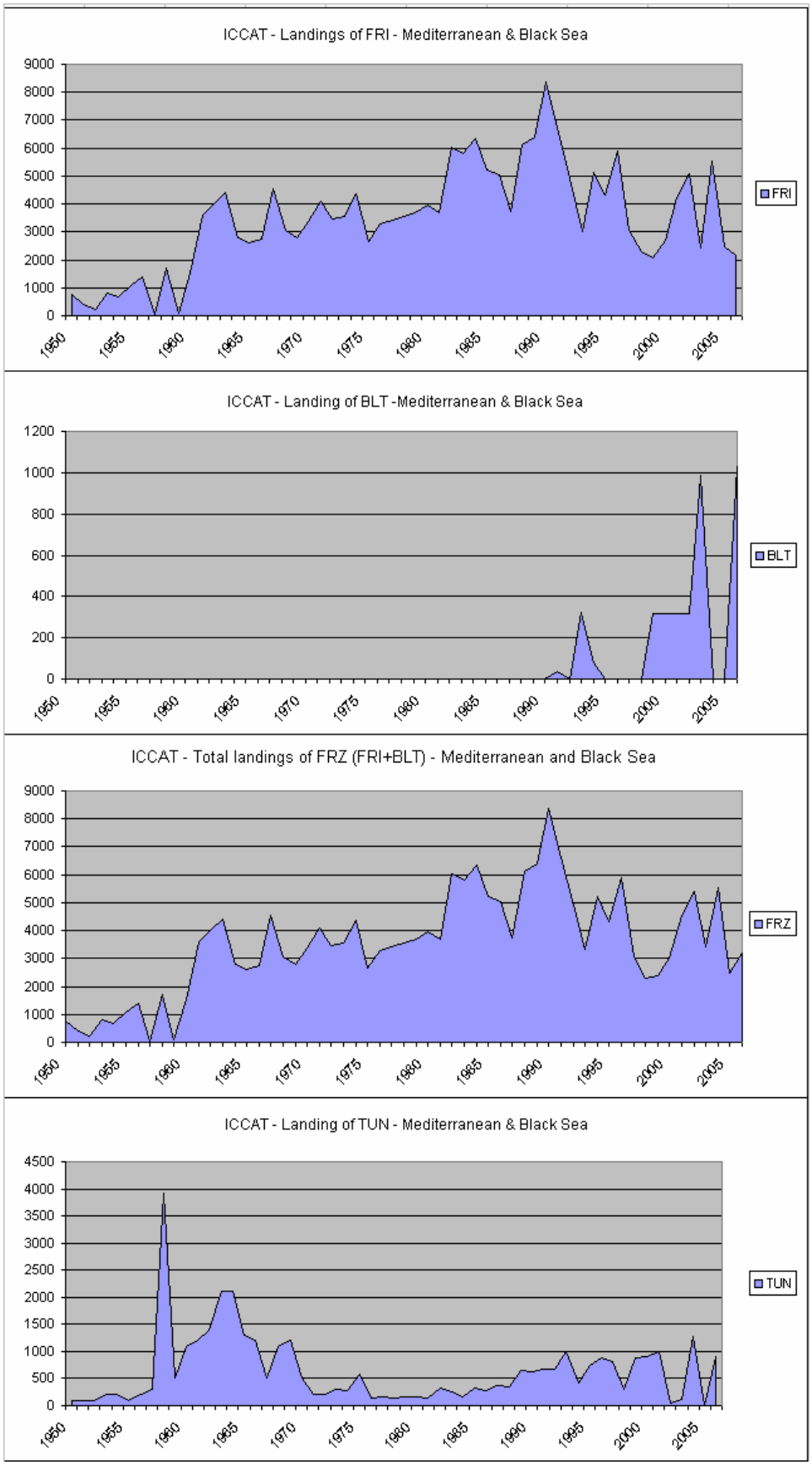

Figure 84 – Total catches of frigate tuna (FRI), bullet tuna (BLT), total *Auxis* spp. (FRZ) and thunnini (TUN) in the Mediterranean and the Black Seas, according to ICCAT from 1950 to 2006

The ICCAT database shows that the maximum average yearly catches over the period 1950–2006 are related to Atlantic bonito (*Sarda sarda*) with about 22,599 tonnes (range 327–74 375 tonnes), and then to frigate tuna (*Auxis thazard*) 3 461 tonnes (range 32–8 360 tonnes), little tunny (*Euthinnus alletteratus*) 1 271 tonnes (range 11–3 294 tonnes), thunnini (unidentified tunas) 629 tonnes (range 4–3 916 tonnes), bullet tuna (*Auxis rochei*) 65 tonnes (range 0–989 tonnes), plain bonito (*Orcynopsis unicolor*) 44 tonnes (range 0–252 tonnes) and finally skipjack (*Katsuwonus pelamis*) 39 tonnes (range 0–150 tonnes).

Whenever the identification problem of *Auxis* spp. is taken into account, then it should be better to join the two species of *Auxis* reported to ICCAT for the Mediterranean and the Black Sea, getting into the ICCAT code FRZ (able to include either *Auxis thazard* and *Auxis rochei*). The average over the period is about 3 526 tonnes (range 72–8 360 tonnes).

The ICCAT data show a lot of yearly variation in the fishery of each species and in some cases there are possible periodic cycles. It would be necessary to conduct more detailed analyses to improve definition and understanding of the combined effects of natural population cycles, fishery effort, fishing strategies, ecological factors, and so forth on these oscillations in catches.

Even where the ICCAT data are concerned, it is clear that it cannot be excluded that some small tuna catches might be reported with misidentification problems, as occurs in other databases (FAO and EUROSTAT). These problems can worsen when considering that some countries are reporting catches of one species to ICCAT and another species to a different organization.

It is interesting to make a comparison between different databases, trying to identify and understand any discrepancies better, at least for the most important species in terms of landed quantities. The first comparison is between the FAO and the ICCAT databases (Figures 85, 86 and 87), because a lot of work has been undertaken in the past to homogenize the databases and to try to reduce the discrepancies.

Where the Atlantic bonito is concerned, the data in the two databases are quite comparable, with some discrepancies from 1950 to 1960 and from 2000 to 2004 (Figure 85).

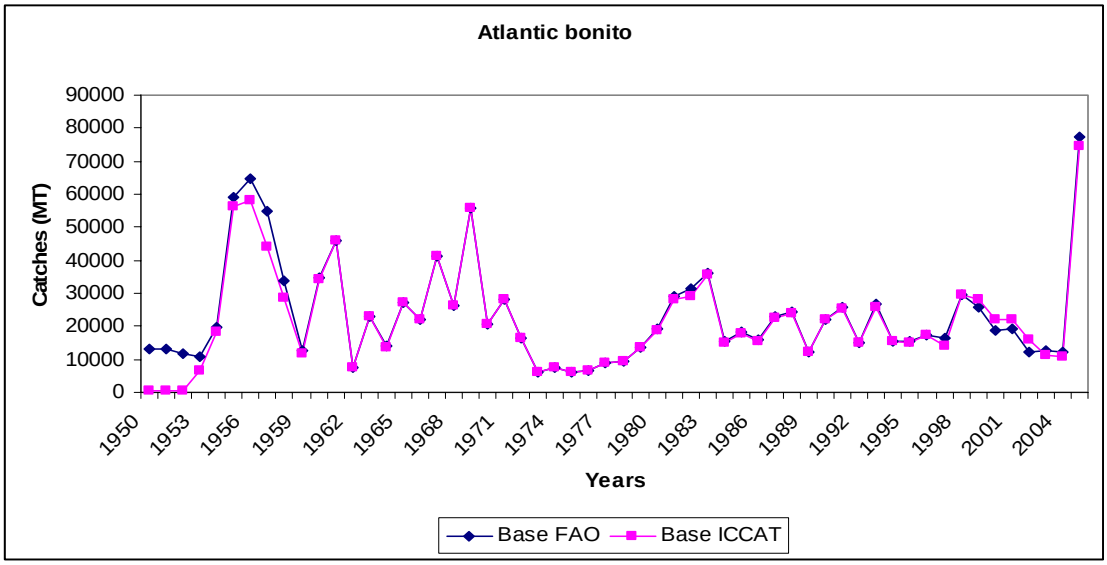

Figure 85 – Comparison of total declared catches for Atlantic bonito between FAO and ICCAT databases

A similar situation exists for the frigate tuna, which is possibly the bullet tuna, according to the most recent discussions about the classification of the Mediterranean specimens. The major discrepancies between the two databases are related to the early period (1950–1961) and again in the most recent years (2001–2004), with isolated years presenting small differences (Figure 86).

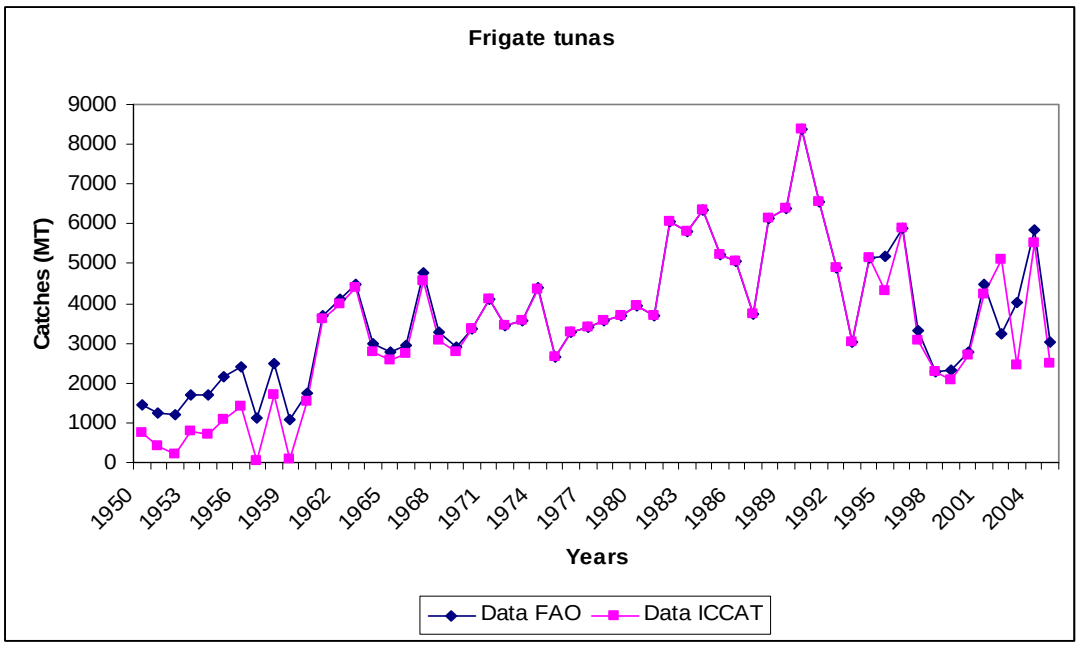

Figure 86 – Comparison of total declared catches for frigate tuna (possibly bullet tuna) between FAO and ICCAT databases

The discrepancies are more relevant in the comparison of the two databases for the little tunny. There is a significant difference in the declared landings from 1950 to 1970 and this might be caused by some countries not reporting data to ICCAT for these early periods. Other discrepancies exist in the last three years (Figure 87).

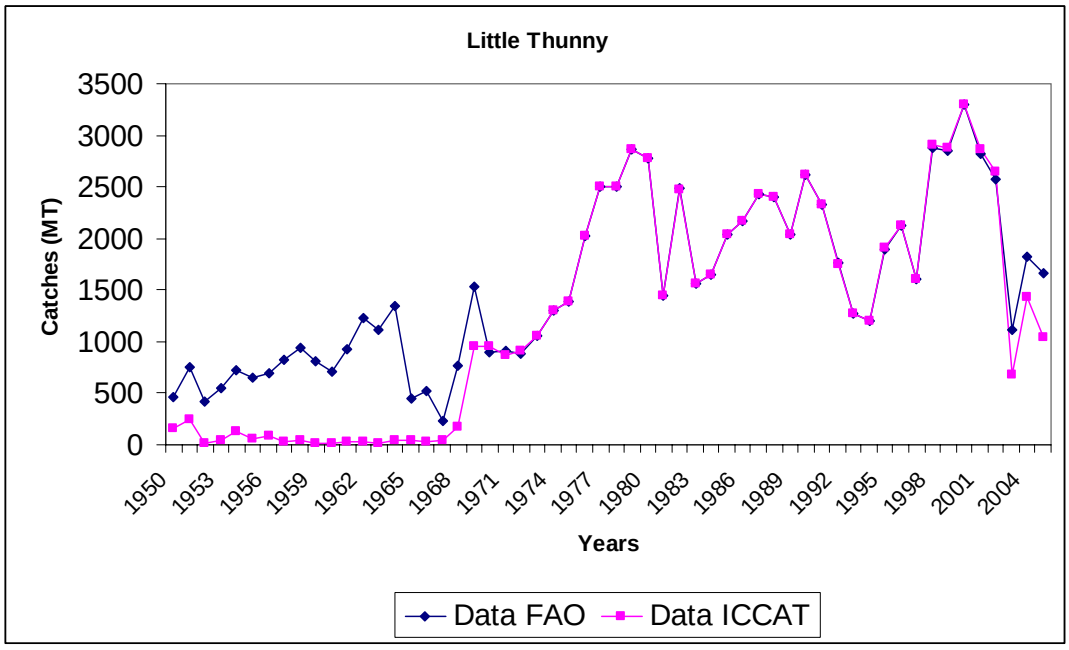

Figure 87 – Comparison of total declared catches for little tunny between FAO and ICCAT databases

The comparison between the ICCAT and EUROSTAT (with a smaller time series) databases shows that most of the problems are situated there and the two databases shows relevant discrepancies (Figures 88, 89 and 90).

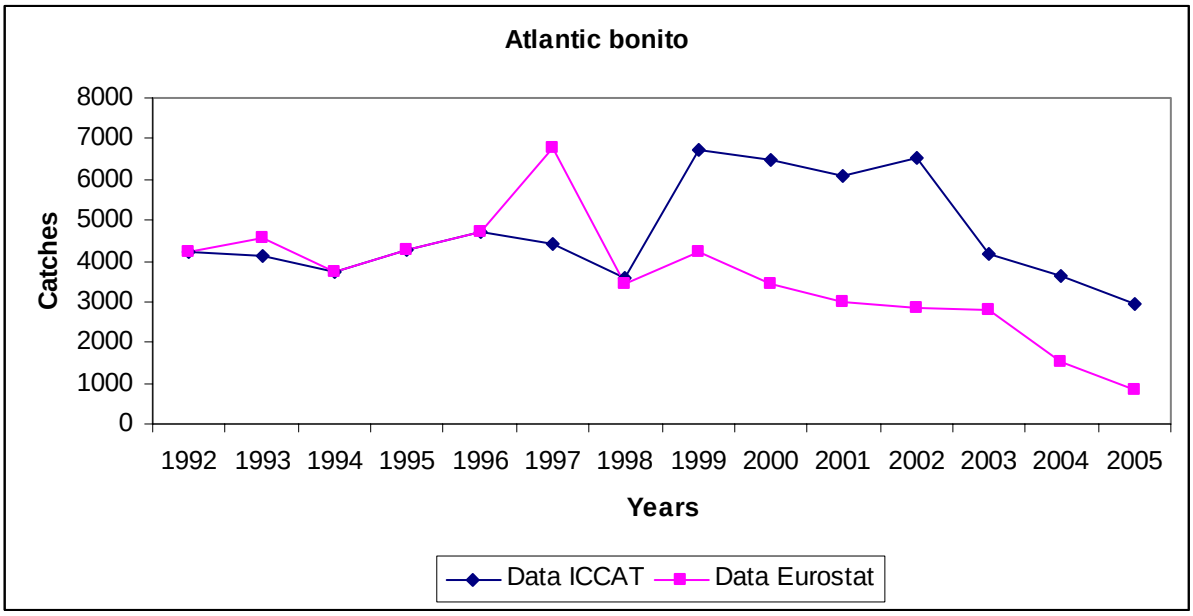

Figure 88 – Comparison of total declared catches for Atlantic bonito between ICCAT and EUROSTAT databases

Major problems exist for the reported landings of Atlantic bonito in the two databases (Figure 88). The discrepancies exist for all years except for 1992, 1994, 1995 and 1996, and they are quite relevant from 1998 onward.

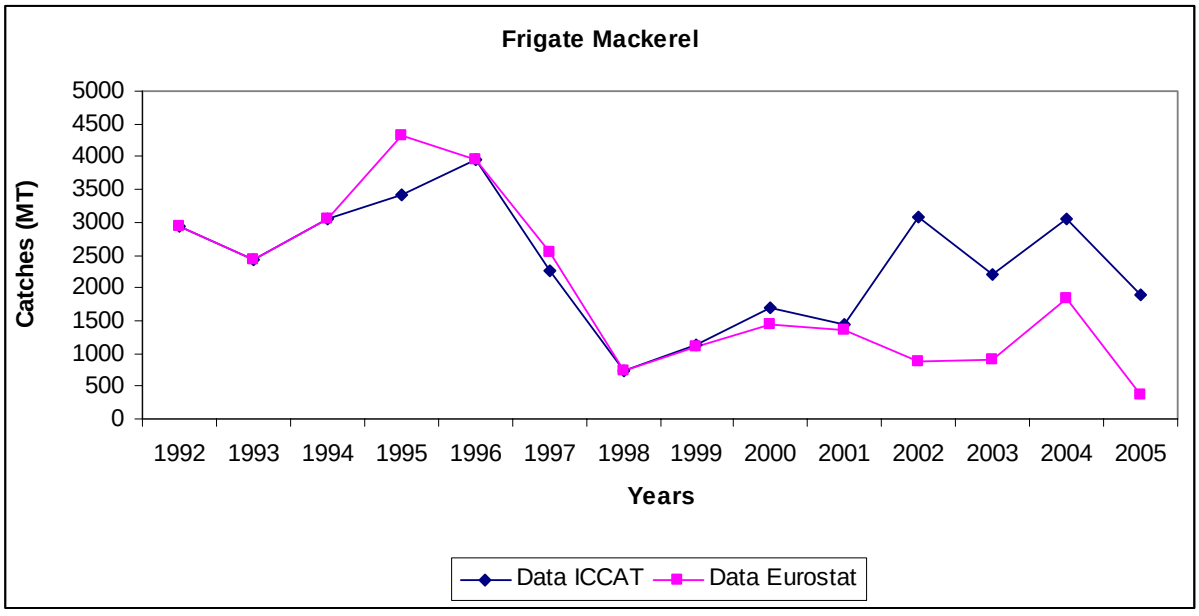

Figure 89 – Comparison of total declared catches for *Auxis* spp. (reported as frigate tuna but possibly being bullet tuna) between ICCAT and EUROSTAT databases

Similar problems exist for *Auxis* spp. (possibly bullet tuna and not frigate tuna), where data are more or less following the same trends until 2001, with some minor discrepancies except for a more relevant one in 1995, after which the two databases start to show major differences until the most recent years.

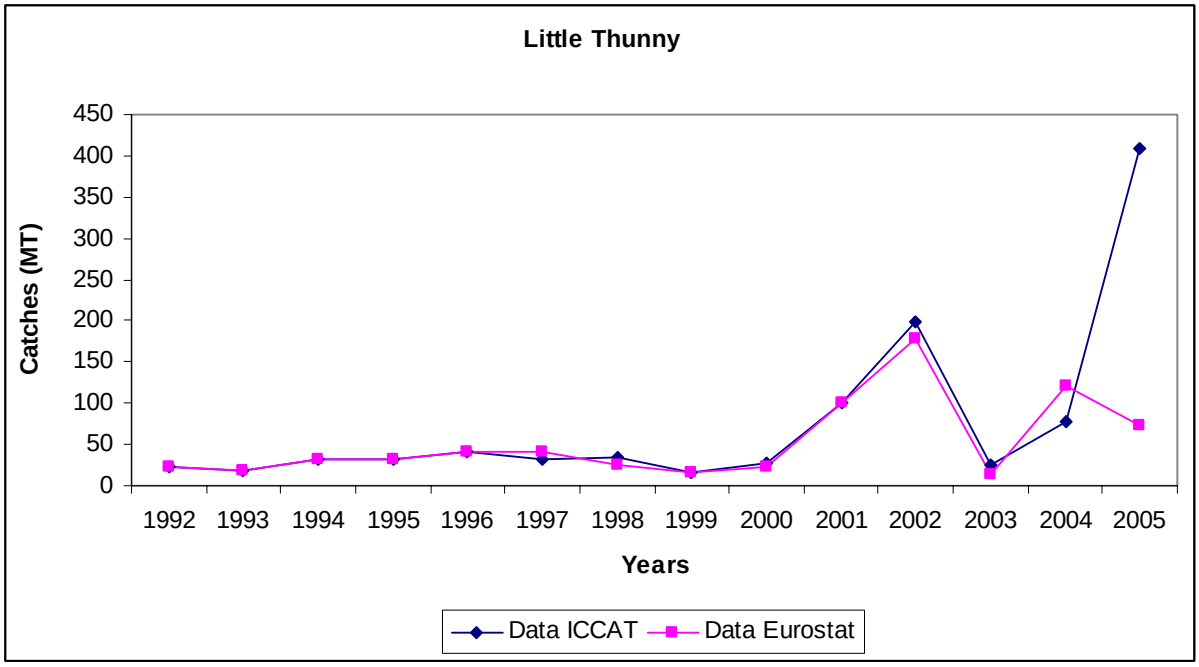

Figure 90 – Comparison of total declared catches for little thunny between ICCAT and EUROSTAT databases

A much better situation exists for the landing data on little tunny. In this case, the two databases show good comparability for most of the years, with very minor discrepancies until 2003. Following this something happened and data start to show discrepancies, which are particularly relevant in the last year.

Other inconsistencies exist for minor small tuna species in terms of reported landings, particularly for skipjack (*Katsuwonus pelamis*) in some countries and for some years.

Another important point, which has emerged from many parts of this report, is the correct classification of some species, either in terms of declaration of statistics or scientific identification according to the most updated zoological nomenclature.

As a matter of fact, it is clear that some discrepancies might be caused by catches declared, for instance, as one species to ICCAT or FAO and as another species to EUROSTAT. This is sometimes caused by two different offices manipulating the original data sets at national level, attributing different international codes to a particular vernacular name. This is likely to occur for small tuna species, because sometimes local vernacular names identify different species in the same way according to different geographical places. This issue needs to be put right, requesting the support of specialized scientific institutions.

A further problem is much more closely related to a scientific issue, already discussed in chapter 3.0. It concerns the classification of *Auxis* spp. in the Mediterranean (and possibly in the Black Sea if present) which, according to the latest scientific findings, should be correctly classified as *Auxis rochei* (bullet tuna – BLT). This is not to be underestimated, because currently most statistics concern *Auxis thazard* (frigate tuna – FRI) in all databases, while some catches of bullet tuna were also reported from time to time. This can create unwanted confusion in the statistics and needs to be solved by a correction to the data bank.

6. CONCLUSIONS

The history of small tuna fisheries in the Mediterranean and Black Seas after World War II appears rather unclear and complicated to define.

The common existing perception that these fishing activities are not particularly relevant either in terms of catches or revenues, is well established almost everywhere, with very few exceptions. This is also still affecting the importance given to the reporting of the catches. It is commonly believed that these fisheries are mostly subsistence activities, while, on the contrary, they are able to provide important production levels. The fleet catching small tunas is practically undefined or not identified in most of the countries, but it is generally known that thousands of small and medium size vessels, engaged in the small-scale, artisanal or