REPORT OF THE 2008
ICCAT WORKING GROUP ON STOCK ASSESSMENT METHODS

(Madrid, February 18-22, 2008)

1. Opening, adoption of Agenda and meeting arrangements

Mr. Driss Meski, ICCAT Executive Secretary, opened the meeting and welcomed participants.

The meeting was chaired by Dr. Victor Restrepo. Dr. Restrepo welcomed Working Group participants, addressed the terms of reference for the meeting and noted that the estimation of fishing capacity did not fit very neatly within the mandate of the Working Group on Stock Assessment Methods. However, since this Group had worked on the capacity estimation last year, it was decided to continue to carry out this work for SCRS. The Chairman proceeded to review the Agenda which was adopted without changes (**Appendix 1**).

The List of Participants is attached as **Appendix 2**.

The following participants served as Rapporteurs for various sections of the report:

Section	Rapporteurs
1, 4, 6	P. Pallarés
2	D. Gaertner and C. Brown
3	V. Ortiz de Zárate, J. Ortiz de Urbina and J. Ariz
5	G. Scott

2. Assessment of fishing capacity by country/fleet/gear/fishery

The Commission's Working Group on Capacity met in July, 2007, and decided to focus on eastern Atlantic and Mediterranean bluefin (BFT-E) as the primary stock of concern, and asked for more refined quantitative estimates of capacity for the stock. In addition, that Working Group requested that the SCRS and the Secretariat further develop reports on the status of other stocks and the different fleets actively engaged in the fisheries.

This meeting carried out work on the estimation of fishing capacity for managed ICCAT stocks with a focus on those that are estimated to have exploitation rates above the Convention's target (i.e., $F > F_{MSY}$). Such work is made difficult by the paucity of available detailed information on the activity of fleets by species. The results of the evaluations carried out by the group, primarily in aggregated form due to data unavailability, are presented below under this agenda item. In addition, it is expected that SCRS will also be able to consider any other capacity estimates specific to BFT-E that the 2008 Bluefin Species Group may be able to provide.

Terminology

The Group noted that the Commission's Working Group and many other fora continue to use the term "capacity" generically, to mean different things. The Group believes that it would be useful if different terms were adopted, for example, those offered by the 2007 Methods Working Group meeting, which are repeated below with modification (in particular, the definition of overcapacity has been modified to make it clear that target catch or capacity should change when stocks fall below B_{MSY}).

Term	*Definition*	*Comments*
Capacity	Refers to the potential to catch fish.	Capacity is sometimes indexed by an indicator of vessel size (e.g. carrying capacity), and sometimes by a measure of potential output (harvesting capacity).
Harvesting capacity (Capacity output) (Fishing capacity)	The potential output (catch, F) that could be realized from a stock at a given time if all of the available fishing effort were used efficiently.	Harvesting capacity is usually greater than actual catch (or actual F).
Capacity utilization	The ratio of actual catch (or F) to harvesting capacity.	Capacity utilization would be equal to 1.0 if all of the available fishing effort were used, given the state of technology, environmental conditions, and stock size.
Carrying capacity	Usually the tonnage of fish that can be stored on the vessel when it is fully loaded, or the storage area, measured in m^3.	Sometimes used as an indicator of the fishing capacity of a vessel under normal operating conditions.
Excess capacity	The difference between harvesting capacity and actual harvest (or F).	Excess Capacity and Capacity Utilization are closely related.
Fishing power	Refers to relative efficiency at catching or generating a relative F between gear and vessel types and over time.	Usually defined by reference to a "standard vessel".
Overcapacity	The generic term for excessive levels of capacity. It is measured by the difference between harvesting capacity and a sustainable management target.	The management target will generally change depending on stock status. For healthy stocks, it may be catch levels equal to MSY. For overfished stocks, the target will be lower catch levels that will allow for rebuilding to Bmsy

2.1 Aggregate estimates based on vessel numbers

The Secretariat organized the available vessel lists (Record of Vessels over 24m, [Rec.02-22]; Record of Carrier Vessels, [Rec.06-11]; Record of BFT Farming Vessels, [Rec. 06-07] and Record of BFT Fishing Vessels, [Rec. 06-05]), in order to examine the different lists for overlap. Currently, there are 5556 unique vessels included in the various lists held at the Secretariat, exclusive of carrier vessels (**Table 1**).

2.1.1 ICCAT Record of LSTFVs

There are currently (February 2008) 3,588 large-scale vessels which hold authorization to fish within the ICCAT Convention area, as reported by CPCs (**Table 2**) according to [Rec. 02-22], which amounts to a total GRT of 1,150,765 t. This list typically carries no information about vessels <24m LOA and thus cannot be taken to provide a complete view of the vessels potentially used to capture Atlantic tunas and tuna-like species. Additionally, the list holds records of vessels that are authorized to fish in other ocean basins which have no history of fishing in the Atlantic and thus does not accurately reflect the currently active fleet of Atlantic tuna fishing vessels >24m LOA. On the other hand, IUU vessels would not be included in this list. Details characterizing the size and volumes of the vessels in the vessel list are incomplete and for the purposes of **Table 2**, relationships between vessel length and GRT were developed for all those vessels with incomplete information.

2.1.2 Fleet size statistics and annual reports

ICCAT has systems in place to collect information on fleet size and characteristics related to the Atlantic tuna fisheries. This includes Task I fleet statistics reports to ICCAT, which are part of the statistical reporting obligations for ICCAT Contracting Parties. Parties are requested to provide detailed information, including gear,

target species, overall length (LOA) and gross registered tonnage (GRT). Unfortunately, these reports are incomplete (**Table 3**). A survey was conducted by the Secretariat after the 2005 Seville Commission meeting in which CPCs were requested, in part, to submit information on fleet sizes. Many CPCs did not provide information on fleet size in response to this survey, and information on fleet characteristics was very limited.

During this meeting, Annual Reports submitted during 2006 and 2007 (reflecting fishing activities in 2005 and 2006, respectively), were examined to consider the potential for extracting fleet information. Many Annual Reports do include information on the number of vessels in each fleet, by gear. Information on length and tonnage is generally lacking, however. There is also inconsistency across Annual Reports as to whether vessels are reported as being licensed, registered, or actively operating in the fishery; often this is not clearly specified.

Fleet sizes obtained through these three sources (Task I, survey, and Annual Reports) are compared in **Table 4** for 2005 and 2006. A number of difficulties in making such a comparison are immediately obvious. Often one or more sources are missing for a particular year. Gear is often not specified, or totals are reported together for several gears, with the result that gear is listed here as "unknown" (UN). There are also some inconsistencies in numbers of vessels reported through each method. Some of these inconsistencies may be due to the lack of detail in the reports (particularly the annual and survey reports), as well as difficulties in interpretation of the information in the Annual Reports. Some large disparities in number of vessels are the result of the inclusion (or exclusion) of artisanal and/or small vessel fleets in the annual or survey reports. These artisanal, small vessel fleets may catch tuna and tuna-like species, although generally at much lower rates per vessel than their industrial counterparts, but they are not typically reported in ICCAT Task I statistics.

As a result of these disparities, as well as the inconsistent inclusion of small vessels in the numbers, it is difficult to produce an accurate total of overall vessels targeting tuna and tuna-like species in the Atlantic using any single source. However, Task I submissions of fleet size for 2006 were relatively more complete than for many other years. The total number of vessels reported for 2006 was 9,200. If available annual report or survey information is used to provide fleet sizes (excluding artisanal fleets) when these were not reported, the total number of vessels increases to 9799. This should be regarded as a minimum estimate, since fleet sizes remain unreported through any of these sources for some CPCs. This exercise does confirm that it is possible to obtain some basic information about fleet sizes through the examination of annual reports. However, considering the lack of clarity concerning how to categorize vessels by gear and activity status, and the general lack of information on vessel length and tonnage which would be needed to evaluate the relative fishing power or capacity of the vessels, this approach is a poor substitute for properly submitted Task I fleet statistics. The lack of a complete and regular submission of these data by the CPCs hinders the ability of the SCRS to provide more complete information to the Commission on this issue.

2.2 Aggregate estimates from other sources

2.2.1 Total number of LL hooks

The Group considered that one of the key elements for estimating total longline fishing capacity is the amount of fishing effort directed to a certain species in time and space (targeting effect). This would be possible to achieve by using individual vessels fishing operations (e.g., fishing sets from log-book data) and economic incentives to fishermen on target species (e.g., ex-vessel price on local markets, costs of operations). It is, however, difficult to apply such type of analysis on the aggregated catch and effort (Task II C/E) statistics reported to ICCAT by CPC's, which only contains the total amount of sampled fishing efforts and corresponding species catch composition, by month and 5 by 5 degree squares.

For the aggregated Task II C/E, one possible approach is to allocate aggregated fishing efforts to the proportion of catches for target species. Three-step analysis needs to be applied for each country:

- identify potential target species and sum up the catches of these species as the total target catch;
- calculate the proportion of each target species catch within the total target catch;
- allocate the total fishing effort (e.g., number of hooks for longline) according to the proportions of each target species catch.

Note that the approach assumes that the relative abundance of the species in the analysis is constant overtime. As an example of possible use the method was applied to the Japanese longline. **Figure 1** shows the time series of species catch (number of fish) composition for Japanese longline between 1956 and 2005. From this figure, three

dominant species in the catch composition were identified: bigeye tuna, albacore tuna and yellowfin tuna. These three species can be considered as target species.

Following the approach, the proportion of each target species catch within the total target catch was calculated (**Figure 2**). This proportion was applied to decompose the total number of hooks to the number of hooks for each target species (**Figure 3**).

Even considering this method as an approximation to species-specific longline effort, the outcome would contribute to improve the estimation of fishing effort (and capacity) associated with each major species.

On the other hand, the total number of hooks by year gives an overall indicator of the total longline fishing capacity evolution over time. This estimate (total hooks by fleet and year) was made during the 2007 meeting of the Sub-Committee on Ecosystems (Anon, 2007). An update of those estimates was presented by the Secretariat and is shown in **Figure 4**. Estimates for 2006 are provisional, once the two major longline fleets only covers partial data (Chinese Taipei bigeye fleet and a substitution Japanese by 2006 TASK II C/E).

2.2.2 Baitboat effort pattern estimation from Task II catch & effort statistics. General Linear Model used to obtain standardized estimates of effort for the baitboat fishery in the ICCAT region

A General Linear Model (GLM) was applied to data from baitboats operating in the ICCAT region in order to obtain a standardized estimate of effort trend over the available time period. The dataset was composed of information regarding effort (in various unstandardized forms) expended per flag. Nominal Task I catch data were added to the dataset to calculate CPUE.

Methodology

The aggregated annual C/E sample data for baitboats were first separated into samples of tropical tunas (yellowfin, bigeye, skipjack) and of temperate tunas (bluefin and albacore) over the period 1950-2005. These observations represented samples obtained from the full suite of flags for which reports have been entered into the ICCAT data set. The model was applied using the statistical package *R* ver. 2.4.1. (*R* Development Core Team 2003). The input data were the CPUE series obtained by dividing the nominal catch per flag per year, by the unit of effort provided for that fleet. The factors included in the GLM were flag, effort type (the unit or measure of the effort value provided) and calendar year. All factors were categorical in nature. The data were separated into two sets. The first set included the temperate tuna species (bluefin and albacore) while the second included the tropical tunas (yellowfin, bigeye and skipjack).

The two models constructed using the CPUE data are described in more detail below.

a) Data used in the models

CATCH AND EFFORT DATA - The CPUE series based on yearly catch by flag divided by the total effort expended per year was used. In the models, the CPUE data was log transformed, and a constant of 1 was added due to the prevalence of 0 catch data cells in the catch matrix.

YEAR – The calendar year in which harvesting occurred was used.

FLAG – The fishing nation responsible for the catch

EFFORT TYPE – Effort data for the baitboat fleet in the ICCAT region displayed a wide variety in effort units. Anything from days fishing to number of poles has been captured as an index of effort. The different units of effort were coded and included in the model as a categorical factor

b) Temperate tuna GLM

Two separate GLMs were calculated for the temperate tuna species. The CPUE data and hence the model was separated by hemisphere. The southern hemisphere dataset was extremely limited prior to 1979 and so the model was only initiated in this year. For the northern hemisphere, the model was initiated in 1952. The temperate tuna GLM applied the following equation:

$$CPUE = \mu + \alpha_{year} + \beta_{flag} + \gamma_{efforttype} + \varepsilon$$

Where: CPUE is described above,
μ is the intercept,

α_{year} is a factor with levels associated with the number of years in the model (55 levels representing 1952 – 2006 for northern hemisphere, and 28 levels representing 1979-2006 for the southern hemisphere).

β_{flag} is a factor with 16 levels (the total number of fishing nations for which data is available),

$\gamma_{Efforttype}$ is a factor with 12 levels associated with the diverse fishing effort units

ε is the error term assumed to be normally distributed.

The above model assumes a normal Gaussian distribution in the CPUE data.

The standardized CPUE for a specific year is calculated by averaging over the CPUE estimates obtained for each nation in a particular fishing year:

$$E(CPUE_y) = [\sum_f CPUE_{y,f}] / No.flags.year$$

Where, $E(CPUE_y)$ is the standardized CPUE for year *y* and $CPUE_{y,f}$ is the GLM estimated CPUE for year *y* and flag *f*. No.flags.year is the count of the flags operating in the given year.

c) Tropical tuna GLM

The tropical tuna GLM applied the following equation:

$$CPUE = \mu + \alpha_{year} + \beta_{flag} + \gamma_{efforttype} + \varepsilon$$

Where: CPUE is described above,
μ is the intercept,

α_{year} is a factor with 44 levels associated with the years 1963 – 2006.

β_{flag} is a factor with 18 levels (the total number of fishing nations for which data is available, The Ghanaian data was separated into 3 fleets: (a) prior to 1991; (b) 1991-1995; (c) post-1996 in order to reflect the shifting methods used by the Ghanaian fishing fleet during those time periods),

$\gamma_{Efforttype}$ is a factor with 12 levels associated with the diverse fishing effort units

ε is the error term assumed to be normally distributed.

The standardized CPUE for a specific year is calculated by averaging over the CPUE estimates obtained for each nation in a particular fishing year:

$$E(CPUE_y) = [\sum_f CPUE_{y,f}] / No.flags.year$$

Where, $E(CPUE_y)$ is the standardized CPUE for year *y* and $CPUE_{y,f}$ is the GLM estimated CPUE for year *y* and flag *f*. No.flags.year is the count of the flags operating in the given year. For the tropical tuna model, an obvious data error for the year 2000 was corrected by removing the estimated CPUE calculated for that year and using an estimate obtained by averaging the values obtained for 1999 and 2001.

d) Obtaining estimates of effort

Once standardized estimates of CPUE were calculated for each model, these annual estimates were divided back into the nominal catch totals per year in order to obtain a standardized estimate of effort (i.e. nominal $catch_y/CPUE_y = Effort_y$ where Nominal $catch_y$ is the total nominal catch of the specified species in year y, $CPUE_y$ is the GLM output of CPUE in arithmetic scale for the specified species in year y and $Effort_y$ is the standardized proxy for effort in year y). Smoothing splines were fitted to the standardized effort values in order to obtain a clearer indication of the effort trend over time.

Results

All the parameter estimates for the temperate tuna GLM in the southern hemisphere are included in **Appendix 3**. **Figure 5** shows the GLM standardized CPUE series per year and the nominal Task I catch series per year while **Figure 6** shows nominal catch and calculated standardized effort per year for the southern hemisphere. **Appendix 3** and **Figures 7** and **8** show the corresponding results for the northern hemisphere GLM. An additional plot has been included for northern hemisphere standardized effort (**Figure 9**). This figure includes only data from 1970 to present in order to remove the influence of the anomalous data from the mid-1960s.

All the parameter estimates for the tropical tuna GLM are included in **Appendix 3**. **Figure 10** shows the GLM standardized CPUE series per year and the nominal Task I catch series per year while **Figure 11** shows nominal catch and calculated standardized effort per year.

Discussion

The GLM models represent an attempt at attaining a standardized estimate of effort for the tuna baitboat fishery in the Atlantic Ocean. At this stage, no interactions were included in the models and only one model structure was assumed (Gaussian). Attempts to split the data into finer resolution by species may be attempted in the future, but tentative attempts proved unsuccessful at obtaining a consistent time series of CPUE outputs.

Estimates of CPUE for the temperate tuna species in the southern hemisphere indicate an overall increase since 1979. The estimated values are however highly variable in recent years and so should be treated with caution. Corresponding effort calculations indicate a fluctuation in effective effort, with effort increasing in the mid 1990s and then decreasing until 2004, with a mild increase again thereafter.

Estimated CPUE in the northern hemisphere appears to be relatively stable. CPUE decreased from the very high values estimated for the early 1950s, but has remained range bound since the 1980s. Corresponding effort calculations are difficult to interpret. In 1963 and 1964, only two data points are available. In each case a positive effort corresponded with a zero catch event. As a result, the estimated CPUE was very low. Consequently, when GLM estimated CPUE was divided into nominal catch in order to obtain the effort index, very high values for effort were obtained. This problem needs to be investigated further. Outside of these years, it would appear that effort declined gradually from the mid-1970s until the mid-1990s at which stage it increased rapidly, but has subsequently declined again until 2006.

The CPUE estimates for tropical tunas show an increase from the early 1950s to the mid-1980s after which CPUE decreased rapidly until the early 1990s, with a gradual subsequent decrease until 2006. Estimates of effort on the other hand have shown a steady increase after reaching a peak in the late 1990s and early 2000. As previously mentioned, data for 2000 had to be omitted from the calculation of effort, as a low CPUE resulted in unrealistically large estimates of effort for that year. The smoothed index however requires further investigation, as there are almost certainly more elegant and realistic techniques for treating this data anomaly.

2.2.3 Tropical purse seine carrying capacity

With regard to the tropical surface fisheries, detailed data collected on European (and associated flags) Atlantic tropical purse seine (PS) vessels available through national scientists and numerous SCRS reports can be used to estimate the fleet-wide tropical PS characteristics.

Updated information concerning vessel characteristics, fishing strategy (i.e., FADs fishing, cooperation PS-BB), landings, CPUEs, etc, related to the Ghanaian fishery was presented to the Working Group for the period 1990-2006. The information provided in number of boats was converted in GRT based on the average GRT per vessel for each gear observed in this fishery in 2006 (i.e., baitboats: 443 t, range: 250-500t and purse seiners: 831t, range: 500-1000 t) and then aggregated to the carrying capacity of the corresponding EC surface fishing gears (**Figure 12**).

The change over the years of total catch for the three main tropical tuna species as well as an estimate of loss rate (Z) per species, based on length frequency data, were compared with the aim of identifying their potential correlation with the changes in the carrying capacity of the surface fleets (**Figure 13** and **Figure 14,** respectively). From the comparison between the carrying capacity and the total catch for purse seiners it is evidenced that the maximum catch reported at the beginning of the nineties was obtained with a carrying capacity lower that it was observed for the previous peak of catches in 1981-1983 period as shown by the ratio of

total catch/carrying capacity = 2.86 in 1982 vs. 5.57 in 1993. This index remains at 6.32 in 2006 even if this fleet is becoming older (**Figure 15**) Such an increase in efficiency of the purse seiners (i.e., not directly related to vessel hold volume) may be due in part to the massive use of FADs fishing operations in the eastern Atlantic and/or the introduction of new fishing technology on board. Although this effect is less pronounced for baitboats, it must be stressed that the baitboat total catch remained stable over the period when carrying capacity decreased slowly. These patterns are reinforced by the comparative analysis with the total mortality series. In spite of purse seine carrying capacity decreasing in the recent years, the apparent total mortality of yellowfin and bigeye remained at high values. It has been noticed however that the potential relationship of causality between the carrying capacity of surface fisheries and Z may be altered by the fact that both species are caught also by the longline fishery. In contrast, the decrease of Z observed for skipjack (a species targeted only by the surface fisheries) since the mid nineties is in agreement with the decreasing trend in carrying capacity observed for the same period of time. It is unclear, however, whether this pattern is due to the reduction of the nominal fishing effort or results from the application of the moratorium on FADs fishing adopted by the EC purse seiners since 1997.

In addition, the Working Group analyzed the changes over time of the average catch per vessel for three size category of EC purse seiners (only vessels fishing for more than 10 years and with a minimum catch of 800t/year were considered). Results from this analysis indicated that the average catch per vessel has been stabilized for the smallest and the largest size class of purse seiners (< 1000m^3 carrying capacity and >1500m^3 carrying capacity, respectively) since the early 1990s at about 2900 t/year and 5600 t/year, respectively (**Figure 16**). In opposite, the performance of the intermediate size class (1000-1500m^3 carrying capacity) depicted a slow but continuous increasing trend, and then sharply increased after 2001.

During the Methods Working Group held in 2007, a comparative analysis of the changes over time of the carrying capacity of purse seiners operating in other oceans was conducted. From this study different patterns were observed:

- In the Indian Ocean, at the beginning of the purse seine fishery, carrying capacity increased rapidly between 1984 and 1993, and remained nearly constant thereafter. It should be noted that the capacity of the dozen supply vessels operating in Indian Ocean is not accounted for because they do not catch tuna, even if their assistance greatly increased the fishing power of the PS fleet active on FADs, as indicated by a steady increase of total catches during recent years (1993-2005) when carrying capacity remained nearly constant (see **Figure 17**).

- In the eastern Pacific, since 1980, carrying capacity of the tropical purse seine fleet has been always much higher than in the other oceans. During the early 1980s the very large capacity produced only low yearly catches, while catches triplicate in the recent years for a comparable level of capacity.

These differences in the observed relationship between yearly catches and carrying capacity are linked with the changes in the nominal CPUEs observed in each ocean for these purse seine fleets (see **Figure 18)**. The Atlantic nominal CPUEs are low relative to the other oceans and this result can explain why there has been no renewal of the purse seine fleet and a steady decline of carrying capacity for purse seine in the Atlantic. In contrast, nominal CPUE in the Indian Ocean has been continually increasing. This feature also explains the renewal of the purse seine fleets in the Indian Ocean (where the average age of the purse seine fleet is 16 years) in contrast to the purse seine fleet active in the Atlantic Ocean (wherein no new tropical purse seine vessels have been introduced since 1992) and the fleet now have an overall average age of over 26 years, (see **Figure 19**). This average age of the purse seine fleet and its recent rate of yearly renewal may be important factors when analyzing the dynamics of the fishing capacity: it would appear for instance that a given carrying capacity of a purse seine fleet will not have the same efficiency and the same prospects when the fleet has an average age of only six years (the Atlantic fleet in 1980) or when there is a senescent fleet with an average age over 26 years (the Atlantic fleet in 2006); with very uncertain prospects to bring new boats in the Atlantic (due to the increasing costs of purse seine vessels and as the CPUE in the area are relatively low).

In conclusion, the comparative analysis of the observed relationship between carrying capacity of the purse seine fleets and their yearly catches show well the high degree of variability between carrying capacity and production: (1) as a function of each ocean (each ocean showing a peculiar pattern, probably linked with its biological productivity and competition between purse seiners and other gears), and (2) within each ocean, as a function of the years and period, with a global tendency in all areas to improve the nominal CPUE, due to technology creep from multiple improvements in the fishing practices of PS, even when the fleets are ageing ones. These features are not generally captured in capacity metrics and for that reason, capacity based

management procedures may be insufficient, by themselves, to provide adequate safeguard against the risk of overexploitation of tuna resources.

2.3 Species-specific information

2.3.1 BFT-E from vessel and farming lists

Regarding the bluefin fisheries in the eastern Atlantic and Mediterranean, analyses were based on the ICCAT Record of BFT Fishing Vessels and BFT Farming Vessels. The metrics used to estimate capacity were number of fishing and farming vessels by flag, fishing gear and vessel length categories (based on the categories used for the Task I) and total hold capacity (m^3) of fishing and farming vessels by flag, fishing gear and vessel length categories. Whenever tonnage (GRT, t) information for a particular vessel was not recorded in the aforementioned lists of vessels, it was estimated through the corresponding gear specific LOA length of vessel, (m) -GRT (t) relationship (see 2.1.1). Total GRT figures by flag and gear for both, fishing and farming vessels, were converted to hold capacity (m^3) assuming a conversion factor of 0.7 (2007 Assessment Methods Report).

The number of fishing and farming vessels by flag, fishing gear and vessel length categories is shown in **Tables 5** and **6**, respectively. Total hold capacity figures by flag and gear for both fishing and farming vessels are shown in **Tables 7** and **8,** respectively.

As regards farming capacity for bluefin tuna in the Mediterranean, according to the ICCAT record of farming facilities (January 2008), it has grown to about 59,842 t, which would represent approximately 48,000 t round weight of (large) fish at time of capture (**Figure 20**). This estimated capacity is about 170% of the TAC agreed by the Commission at its Dubrovnik meeting in 2006 and represents a capacity excess of more than 32,000 t above the predicted short-term catch level that would permit eastern bluefin tuna stock to rebuild to B_{MSY}.

2.3.2 ALB-N from vessel list

The *Recommendation by ICCAT on Limitation of Fishing Capacity on Northern Albacore* [Rec. 98-08] provides that "...Contracting Parties, and non-Contracting Parties, Entities or Fishing Entities fishing for northern albacore shall limit the fishing capacity of their vessels, exclusive of recreational vessels, for this stock from 1999 onwards, through a limitation of the number vessels to the average number in the period 1993-1995. This list was submitted by 1 June 1999 and every year since then. This applies only to those whose average catches are greater than 200 t". This list is reviewed each year in November and adopted by the Commission.

According to ICCAT statistics, and the above criteria, those required to supply lists of such vessels are: Canada, EC, USA, and Chinese Taipei. In application of this Recommendation, **Figure 21** summarizes the number of vessels reported to ICCAT compiled as total, longline vessels and surface fisheries vessels operating in the North Atlantic and targeting albacore. For comparison reasons, the average number of boats for the period of reference (1993-1995) is included by the fisheries categories as longline and surface and total, and represented by the straight line along the period. The first group of vessels in the graph represents the average number declared by those countries/flags mentioned for the considered period 1993-1995.

2.3.2.1 ALB-N evolution of number of vessels holding a license

Considering the available information for the northern Atlantic albacore stock, the number of vessels involved in the exploitation of this stock is the most general measure of capacity at first step. Another type of information extracted from the available data is the length of vessel (m) and the gross tonnage register (GRT) expressed in metric tons (t).

Since the beginning of the [Rec. 98-08] implementation there were a number of changes along the period recorded. As presented in **Table 9,** it is observed that those countries have been reporting the annual number of vessels constantly along the period. The EC vessels apply to the surface fisheries (SURF) in the North Atlantic as shown in **Figure 21.** The surface fishery includes the following vessel gear type: baitboats, trollers, mid-water pair pelagic trawl and drifnetters which were banned from January 1, 2002. On the other hand Canada, USA and Chinese Taipei fleets apply to the longline vessels in the North Atlantic. Nevertheless, a number of recreational vessels are included in this list of USA.

None of the two main fisheries have gone beyond the limit fixed in 1998 and, as a matter of fact, the longline has decreased its capacity by half. As overall the total number of vessels involved in the albacore fishery has been below the total capacity about of level from 25% to 37 % percent from 1999 to 2007.

2.3.2.2 ALB-N Type of vessel by length class and GRT on the licensed list

Concerning the variety of gears and broad type of vessels involved in the exploitation of this stock, another classification has been done based on the length class and GRT class of vessels reported by each country. This process allows to having another indicator of capacity. In the analyses no classification has been done according to a homogeneous set of vessels by gear because this information was not provided or was not consistent trough the years considered or was not accurate. The North Atlantic albacore list includes vessels less than < 24m length in USA, EC-France, EC-Spain and EC-Portugal.

For each country's aggregated fleet, the minimum, maximum and average length (m) and GRT was calculated for each year available in the ICCAT database, which includes 2004 to 2007. The estimated characteristics are presented in **Table 10**. The broad range of vessels length across all EC fleets is observed, which is explained by the inclusion of vessels of even length class <10 m, which are considered artisanal fleet vessels in EC countries but could be considered to be commercial or recreational vessels in the United States. The largest vessels are the longliners of Chinese Taipei and Canada. The overall annual gross tonnage has decreased since 2004.

Relationships between vessel length and volume measures (GRT) were developed for U.S. vessels, EC-France fleets, EC-Portugal fleets, EC-Spain fleets and EC-Ireland from information compiled for 2006. As shown in **Figure 22,** the large number of small scale vessels (< 10 m) provided by those countries, whose carrying capacity is minor, is evident.

2.3.3 SWO-M from Task II

Catches made by longline and driftnet gear account for most of the swordfish fishery production from the Mediterranean for many years. The most recent assessment of Mediterranean swordfish stock status indicates the stock is both overfished and undergoing overfishing. One reason for this is overcapacity of the fleets harvesting swordfish in the Mediterranean.

The Task II C/E data from the Mediterranean were examined to estimate the pattern in the effort tendencies of the longline and gillnet fleets catching swordfish. Over the period from 1985-2005, the available catch-effort samples from the different gillnet and longline fleets catching swordfish were used in a General Linear Model to estimate effort trends. The data for gillnet C/E is sparse, with only 17 aggregate samples, spanning the period 1986-2001, from EC.España, EC.Italy, and Morocco. As the fishery during that period remained relatively stable, a GLM controlling for flag and the unit of effort recorded in the C/E sample was fit to the data. The resulting flag-specific average catch rate was then divided into the Task I gillnet catch plus unclassified gillnet catch for these flags to estimate the relative effort pattern. For the remaining flags, for which no C/E data were available, the overall average C/E value was applied and added to the efforts estimated by flag and year. The resulting pattern is one of relative stability from 1985-2000, with a subsequent reduction to a level about half of the 1985-1994 average level (**Figure 23**).

Likewise, the Task II C/E data from Mediterranean longline fleets were examined to estimate effort trends. Over the period from 1985-2005, more than 11,000 observations available in the Task II data set from longline fleets operated by China, Chinese Taipei, Croatia, EC.Cyprus, EC.España, EC.Greece, EC.Italy, EC.Malta, and EC.Portugal were fit with a GLM accounting for year, flag, and effort units to construct a time-series pattern of relative longline effort, in the manner described above. The resulting relative pattern is contrasted with that estimated for the gillnet fleets in **Figure 23**. The pattern estimated is one of relative stability in the first decade of the data, followed by a rapid increase in recent effort levels. This pattern is consistent with the view that at least some of the driftnet effort has been transferred to longline fishing in the region.

Although there have been recent apparent reductions in overall gillnet fishing effort in the Mediterranean, based on our recent assessment, the overall fishing effort is estimated to be from 1.3 to 2.9 times the level needed to harvest MSY from the stock. Substantial reductions in the current effective effort through managing harvesting capacity and/or other control measures may be required to place the stock on a trajectory of rebuilding towards the Convention objective.

2.3.4 Other information

One indicator of overcapacity is a stock for which fishing mortality is estimated to be greater than F_{MSY}. **Table 11** lists the stocks that would be classified has having overcapacity according to this indicator.

One way in which a minimum estimate of overcapacity could be obtained is by computing:

Overcapacity = (Harvest Capacity) - (Quota) ≈ (Catch) - (Quota)

With the exception of SWO-M and YFT, the stocks in **Table 11** have country-specific quotas or catch limits, so that overcapacity can be computed (see **Table 12**). It should be noted, however, that in cases where quotas are inconsistent with achieving the Commission's objective of rebuilding to B_{MSY}, these estimates of overcapacity are even more strongly negatively biased. Such is likely in the case for bluefin tuna.

3. Review of implementation of quality control procedures

3.1 Assessment software catalogue

One of the tasks that the ICCAT Secretariat has to accomplish is the revision of the software used in the assessment of stocks to be included in the ICCAT catalogue. As inheritance of his previous position in the Secretariat, at present, Dr. Restrepo chairs the reviewing Committee. The Group requested him to continue at least one more year until the new expert is contracted by the Secretariat and the new person in charge will take over this task.

It was noted that the procedure for cataloguing and reviewing new software is not well known by the ICCAT scientists. In order to widespread the knowledge on the cataloguing procedure, the Group agreed that the Secretariat will send the requirements of the documentation for the new software and the procedure followed by the reviewing Committee to the ICCAT head scientists. This was accomplished during the meeting.

A request for the FLR (Fisheries Library in R) software to enter the ICCAT catalogue was considered. The Group recognized that the software is still under development but some of the routines are fully operational and have been used to assess other stocks. Furthermore, it is very flexible and a valuable tool to explore for assessment and simulation of management strategies. In addition, there exists a lot of documentation illustrating its possibilities. It was decided to include the reference of the FLR web page in order ICCAT scientists can further explore it (http://flr-project.org).

3.2 Manual for CPUE standardization

One of the immediate plans of the past Assessment Methods meeting (2007) was to develop a CPUE standardization manual which could be used as a guideline for scientists attending the working groups. Due to time constraints as well as lack of human resources, the aforementioned manual task could not be accomplished. The Working Group agreed that if funds are available, the Secretariat should contract an external consultant to perform the task. Alternatively, a Contracting Party could engage a national scientist for developing the CPUE standardization manual

Furthermore, the Group recommended to the SCRS to hold a meeting of the Assessment Methods Working Group exclusively focused on CPUE standardization which is a problematic issue from the point of view of the diversity of the models applied.

3.3 Technical glossary

The Working Group noted that the technical glossary of assessment terms has not been updated since 1999. It was decided to work out a preliminary draft list of technical terms appearing in the ICCAT working group reports with their corresponding definitions, which would be distributed to all the scientists between now and the SCRS meeting for improvement and adoption. The draft list is included as **Appendix 4.**

3.4 Others

The Working Group noted that peer review is a standard quality assurance practice in science to provide reliable and credible research. Although ICCAT implemented this practice in the past by means of external experts attending the assessment working groups meetings, it is not implemented at present. The Group stressed the need to return to the aforementioned peer review process to meet the standards of the scientific work developed by the assessment Working Groups.

4. Other matters

No other matters were discussed.

5. Recommendations

5.1 Capacity estimation issues

Capacity measures and annual production statistics tend not to remain stable over time and can vary over a wide scale between and within oceans for the same vessel. There is a general tendency for nominal CPUE to increase due to technology creep from multiple improvements in fishing practices, gear and instrumentation, even when the fleets are aging ones.

These features are not generally captured in capacity metrics and for that reason, capacity-based management procedures may, by themselves, be insufficient to provide adequate safeguard against the risk of overexploitation of tuna resources. Detailed information is needed to provide an informed basis for capacity management decisions and that level of detail is generally lacking for the Atlantic tuna fleets, with the exception of some for which National Scientists retain very detailed information useful for this purpose. In order to address these concerns, and to provide a basis for improving the advice SCRS can offer the Commission on the issue of capacity measurement, the Group recommended several actions.

The Group concluded that information on fleets among the various lists and data sets held by the Secretariat is very incomplete. The Group reemphasized the need for CPCs to fulfill their data-reporting obligations as itemized most recently in the *Manual of Procedures for the Submission of Information Required by ICCAT*, including, but not limited to, the information required in the Form-1 (Task I, fleet characteristics) in order to produce answers to the questions formulated by the Commission to the SCRS.

The Group noted that the Commission's Working Group and many other fora continue to use the term "capacity" generically, to mean different things. The Group recommended that the Commission consider adopting the terminology offered in Section 2 of this report.

The Group noted that expansion of fishing capacity is the result of the economic incentives to fishermen and the fishery is an economic activity for fishermen. By using production capital (e.g., fishing vessels, gears) and labor, fishermen harvest fisheries resources and sell at markets for their livings. The aim of fishermen in fishing activities is to maximize their return on their capital, labor and other investments. This implies that possible economic return is an incentive motivating fishermen to expand their fishing capacity. Without economic analyses, fisheries management is not able to dampen such economic incentives and regulate excess fishing capacity in an informed way. The Group recognized that economic data collection and analysis on tuna and tuna like-species are indispensable parts of future research and policy developments regarding this issue and recommends that CPCs engage in this research and provide input to guide the Commission's policy debates regarding fishing capacity management.

While there is continued room for methodological development for capacity measurement and estimation, it is evident to the Group that continued advancement on the issue of methodological approaches is unlikely to be realized without additional, detailed data. The Group recommends that Species Groups address, to the degree possible, issues related to overcapacity in the fleets harvesting species under their purview and that the Species Group specifically address these issues in the Executive Summaries.

5.2 Other Recommendations regarding future work of the Group

In order to better assure transparency and improve quality assurance of our scientific work, Species Groups should work toward making sure that software used for assessing stock status and providing advice to the Commission is included in the ICCAT Assessment Software Catalogue.

The Group recommended the developers of FLR (Fisheries Library in R) software consider entering the software into ICCAT catalogue at such time that it is appropriate.

The Working Group noted that peer review is a standard practice in science to provide reliable and credible research. Although ICCAT implemented this practice in the past by means of external experts attending the assessment working groups meetings, it is not implemented at present. The Group stressed the need to return to the aforementioned refereeing process to meet the quality standards required of the scientific work developed by the assessment Working Groups. This will require an annual financial commitment of 20,000 Euros.

The Working Group recommended that the SCRS technical glossary be updated and a draft revision be distributed to ICCAT scientists in advance of the next SCRS Plenary for improvement and adoption.

The Group recommended that progress on the CPUE manual be pursued either through contract of an external consultant to perform the task or, alternatively, through a Contracting Party engaging a national scientist for this work with a target completion date of the end of 2009.

The Group recommended the next meeting of the Assessment Methods Working Group exclusively focus on problematic CPUE standardization issues considering the diversity of the models applied.

6. Adoption of the report and closure

The report was adopted during the meeting.

The Chairman thanked the participants and the Secretariat for their hard work.

The meeting was adjourned.

Table 1. An accounting of the unique vessels held on the ICCAT vessel lists (as of Feb 20, 2008).

Count of ICCAT List Number	
Reporting flag	*Total*
Algerie	4
Belize	13
Brazil	39
Canada	70
Cape Verde	19
China, P.R.	38
Chinese Taipei	110
Côte D'Ivoire	1
Croatia	109
EC.Cyprus	11
EC.Denmark	2
EC.España	1042
EC.France	250
EC.Greece	415
EC.Ireland	58
EC.Italy	595
EC.Malta	108
EC.Netherlands	10
EC.Portugal	338
EC.United Kingdom	256
EC-others	10
Ghana	34
Guatemala	2
Guinée Rep	3
Honduras	2
Japan	512
Korea, Republic of	202
Libya	49
Maroc	71
Mexico	2
Namibia	33
Netherlands Antilles	2
Panama	21
Philippines	77
Russian Federation	7
Senegal	10
South Africa	11
St. Vincent and Grenadines	9
Tunisie	66
Turkey	489
U.S.A.	409
Uruguay	6
Vanuatu	2
Venezuela	39
Grand Total	**5556**

Table 2. Number and estimated selected characteristics of vessels currently (February 2008) held in the ICCAT positive list by vessel type. Note that the averages are only indicators of central tendency and that the conversion relationships are only approximations and may not be appropriated in all situations.

Vessel Type	*Total*	*Ave GRT*	*Tot GRT*	*Conversion relationship*
Dredgers	24			
Gill netters	50	206	10,297	$GRT = 0.0748 * LOA^{2.3018}$
Line vessels	146	205	29,876	$GRT = 0.2944 * LOA^{1.8816}$
Longliners	1304	333	434,145	$GRT = 0.0958 * LOA^{2.1561}$
Multi-purpose vessels	31	100	3,091	
No info	364	145	52,640	$GRT = 0.2003 * LOA^{1.9356}$
Other fishing vessels	8	158	1,262	$GRT = 0.0165 * LOA^{2.6273}$
Other vessesl	98	157	15,339	$GRT = 0.0165 * LOA^{2.6273}$
Pole & line	73	270	19,681	$GRT = 0.366 * LOA^{1.827}$
Purse seiners	551	355	195,777	$GRT = 0.0165 * LOA^{2.6273}$
Recreational vessels	42	126	5,274	$GRT = 15.347 * LOA^{0.5824}$
Trawlers	824	212	174,857	$GRT = 0.0061 * LOA^{2.9257}$
Other seiners	1	154	154	
Cargo ship	1	3,817	3,817	
Cellular container	2	4,216	8,431	
Freezer cargo vessel	29	3,801	110,236	$GRT = 0.0748 * LOA^{2.3018}$
Mother ships	3	765	2,296	
Reefer vessel	28	2,928	81,980	$GRT = 0.0047 * LOA^{2.9212}$
Trap setters	9	179	1,614	$GRT = 0.0897 * LOA^{2.2115}$
Grand Total	**3,588**		**1,150,765**	

Table 3. Total vessels reported in Task I statistics by year and flag.

	Year		
Flag	*2005*	*2006*	*Grand Total*
Algerie		420	420
Barbados		36	36
Brasil	154	146	300
Canada	605	1285	1890
Cap Vert	17		17
Chinese Taipei	142	75	217
Croatia	64	63	127
Dominica		491	491
EC.Cyprus	834	1091	1925
EC.España	207	192	399
EC.France		294	294
EC.Greece	472	468	940
EC.Ireland	13	50	63
EC.Italy		118	118
EC.Malta	437	359	796
EC.Portugal	299	372	671
FR.St Pierre et Miquelon	1	1	2
Ghana	35		35
Grenada	855	876	1731
Guyana		1278	1278
Japan	248		248
México	30	30	60
Namibia	46	74	120
Panama		33	33
Philippines		10	10
Russian Federation	8	4	12
S. Tomé et Príncipe	50	50	100
Sénégal		7	7
South Africa	184	199	383
Sta. Lucia		690	690
Trinidad and Tobago	1474		1474
Tunisie	47		47
Turkey	96	75	171
U.S.A.	146	146	292
UK.Bermuda		206	206
UK.Sta Helena		12	12
UK.Turks and Caicos		22	22
Uruguay	12	12	24
Vanuatu		15	15
Grand Total	**6476**	**9200**	**15676**

Table 4. Fleet sizes obtained through three sources (Task I, survey, and Annual Reports).

Year			2005																			TOTAL
FlagName	dsource	ds	BB	GN	HL	HP	LL	PS	RR	SP	TL	TN	TR	TW	UN	HAND	TRAP	TROL	MWTD	HS	SU	TP	
Algerie	Task I	grt																					
	survey	unk					10								985								995
	landings		0	791	271	0	1090	1248	0	0	0	0	0	0	0					0	0	3	3403
Angola	annual reports	unk													24								24
	landings			936	272		189								1208						1242		3847
Argentina	landings			66				4						9163	1265								10498
Barbados	Task I	loa																					
	annual reports	loa					29									218							247
	landings						126																126
Belize	annual reports	loa																					
	landings						302																302
Benin	survey	loa																		76			76
Brasil	Task I	grt	41				99	14															154
		loa	41				99	14															154
	annual reports	unk	41				99																140
	survey	unk	42				71																113
	landings		28146				15090	1604		4											1128		45972
Canada	Task I	grt					131						71		403								605
		loa					131						71		403								605
	annual reports	unk																					
	survey	unk				1248	77		757		757						24						2863
	landings			35	1	208	2240		525		47			3								8	3067
Cap Vert	Task I	grt	1					16															17
		loa	1					16															17
	annual reports	unk																					
	survey	unk													1325								1325
	landings		57		308										2814								3179
China P.R.	landings						8969																8969

Chinese Taipei	Task I	grt					142															142
		loa					142															142
	annual reports	unk					142															142
	survey	unk					200															200
	landings						31644															31644
Colombia	landings													46								46
Côte D'Ivoire	landings			2058																		2058
Croatia	Task I	grt						64														64
		loa						64														64
	annual reports	unk						30														30
	survey	unk												35								35
	landings							1017														1017
Cuba	landings		514				526							72								1111
Dominica	Task I	grt																				
		loa																				
	landings											235										235
EC.Cyprus	Task I	grt					34	1		300	499											834
		loa					34	1		300	499											834
	landings						543			30	62											635
EC.España	Task I	grt	207																			207
		loa	207																			207
	survey	unk	255				276	7								6	550					1094
	landings		27745		14		38231	34386		20		10360		51						1134	1196	113137
EC.France	Task I	grt																				
		loa																				
	survey	unk	9	38				18					78									143
	landings		3461					45446		0				21885								70792
EC.Greece	Task I	grt			60		407	5														472
		loa			60		407	5														472
	survey	unk					200															200
	landings				13		1909	2224														4146

EC.Ireland	Task I	grt									4	9				13
		loa									4	9				13
	survey	unk												25		25
	landings										47	322				369
EC.Italy	Task I	grt														
		loa														
	landings				217	7	7655	3961	546				4443		71	16900
EC.Malta	Task I	grt					436	1								437
		loa					436	1								437
	survey	unk					91	2								93
	landings						723	25								748
EC.Portugal	Task I	grt	225				74									299
		loa	225				74									299
	landings		8816	16			14900	12							593	24336
EC.United Kingdom	landings			14	0		20			0		0			0	36
FR.St Pierre et Miquelon	Task I	grt					1									1
		loa					1									1
	landings						64									64
Gabon	landings											44				44
Ghana	Task I	grt	26					9								35
	annual reports	unk														
	landings		39204	1356				42615								83175
Grenada	Task I	grt					855									855
		loa					855									855
	landings						775				328		18			1121
Guyana	Task I	grt														
		loa														
	annual reports	unk											1129			1129
	landings			3809												3809
Iceland	survey	unk					5									5
	landings												0			0

Japan	Task I	grt				248						248
	annual reports	unk				214						214
	survey	unk				250						250
	landings					28720						28720
Libya	annual reports	unk										
	survey	unk				6	5			3		14
	landings					391	730				42	1164
Maroc	annual reports	unk										
	survey	unk				558			1000			1558
	landings			1584	552	4026	2026		3501		1702	13391
Mexico	Task I	grt				30						30
		loa				30						30
	annual reports	unk				40						40
	landings					11123						11123
Namibia	Task I	grt	21			25						46
		loa	21			25						46
	landings		2064			9633						11697
NEI (ETRO)	landings		152				18100					18252
Panama	Task I	grt										
		loa										
	landings						20962					20962
Philippines	Task I	grt										
		loa										
	annual reports	unk				18						18
	landings					2229						2229
Russian Federation	Task I	grt				1		0				1
		loa				1		7				8
	survey	unk				6	12					18
	landings					26		281				307

Senegal	Task I	grt						
		loa						
	annual reports	loa	6		1		12619	12626
		unk						
	survey	unk	6		1			7
	landings		6896				108	7004
South Africa	Task I	grt	117		23	27	17	184
		loa	117		23	27	17	184
	annual reports	unk	94		66	25		185
	survey	unk	117		49	100		266
	landings		3604		962	954		5520
St. Vincent and Grenadines	landings				975		85	1060
Sta. Lucia	Task I	loa						
	landings						654	654
Trinidad and Tobago	Task I	grt			14		1154	1168
		loa			14		1460	1474
	annual reports	loa					1436	1436
		unk			14			14
	survey	unk			10		1190	1200
	landings				453	2	5141	5597
Tunisie	Task I	grt				47		47
		loa				47		47
	annual reports	loa				53		53
		unk			100			100
	landings			4	791	3245		4040
Turkey	Task I	grt				96		96
	landings				425	73344	734	74503

U.S.A.	Task I	grt		1	18	1	112	5				6	3					146
		loa		1	18	1	112	5				6	3					146
	survey	unk					125	5										130
	landings			1424	360	32	5140	281	12864		2327	2	124		870	3		23426
UK.Bermuda	Task I	loa																
	annual reports	unk																
	survey	unk											200					200
	landings								159				2					161
UK.Sta Helena	Task I	grt																
		loa																
	landings		63															63
Uruguay	Task I	grt					12											12
		loa					12											12
	annual reports	unk					12											12
	survey	unk					8											8
	landings						2438											2438
Vanuatu	Task I	grt																
		loa																
	landings						2303											2303
Venezuela	annual reports	grt	9				25	7										41
	landings		2051	285			1266	3799										7400
UK.Turks and Caicos	Task I	loa																
	landings																	
S. Tomé e Príncipe	Task I	loa											50					50
	annual reports	loa																
	landings				143			725			634							1503
China	annual reports	unk																
Korea	annual reports	unk					13											13
	landings						1750	1145										2895

Dominican Republic	landings																				226	226
EC.Latvia	landings														334							334
Guatemala	landings						10298															10298
Netherlands Antilles	landings																					
Norway	landings		933		118	51	9								43	73						1227
Saint Kitts and Nevis	landings											9										9
UK.British Virgin Islands	landings					4																4

Year			2006																	TOTAL
FlagName	dsource	ds	BB	GN	HL	HP	LL	PS	RR	SP	TL	TN	TR	TW	UN	TRAP	HS	SU	TP	
Algerie	Task I	grt					296	95					11		18					420
	survey	unk																		
	landings			231	108		1062	1792											4	3197
Angola	annual reports	unk																		
	landings																			
Argentina	landings																			
Barbados	Task I	loa					36													36
	annual reports	loa																		
	landings				107		327													434
Belize	annual reports	loa					10													10
	landings						201													201
Benin	survey	loa																		
Brasil	Task I	grt	41				91	14												146
		loa	41				91	14												146
	annual reports	unk	41				91	14												146
	survey	unk																		
	landings		24771		51		11087	246		5					4574					40734

Canada	Task I	grt				437	63		723		62						1285
		loa				437	63		723		62						1285
	annual reports	unk					77		557						7		641
	survey	unk															
	landings			17	0	224	2021		660		44		3			3	2972
Cape Verde	Task I	grt															
		loa															
	annual reports	unk												1116			1116
	survey	unk															
	landings													3664			3664
China P.R.	landings						8587										8587
Chinese Taipei	Task I	grt					75										75
		loa					75										75
	annual reports	unk															
	survey	unk															
	landings						22394										22394
Colombia	landings																
Côte D'Ivoire	landings			2894													2894
Croatia	Task I	grt						63									63
		loa						63									63
	annual reports	unk															
	survey	unk															
	landings							1022									1022
Cuba	landings		536				554							47			1137
Dominica	Task I	grt												491			491
		loa												491			491
	landings			0	137		1					92		2		0	233
EC.Cyprus	Task I	grt					34			600				457			1091
		loa					34			600				457			1091
	landings						604							59			664

EC.España	Task I	grt	192													192
		loa														
	survey	unk														
	landings		27667		4	42899	30347		8	10417		111		1565	993	114012
EC.France	Task I	grt	4			3	61				126	100				294
		loa	4			3	61				126	100				294
	survey	unk														
	landings		2897			593	34202				5691	420				43803
EC.Greece	Task I	grt			61	384	23									468
		loa			61	384	23									468
	survey	unk														
	landings				25	1664	1529									3218
EC.Ireland	Task I	grt								2	48					50
		loa								2	48					50
	survey	unk														
	landings									17	510					526
EC.Italy	Task I	grt				47	71									118
		loa				47	71									118
	landings			2342		7598	7460		277			96			125	17899
EC.Malta	Task I	grt				358	1									359
		loa				358	1									359
	survey	unk														
	landings					530										530
EC.Portugal	Task I	grt	294			78										372
		loa	294			78										372
	landings		15660	12		14778	141								547	31138
EC.United Kingdom	landings			708	10	1598	84			7	1020	0			4	3431
FR.St Pierre et Miquelon	Task I	grt				1										1
		loa				1										1
	landings															
Gabon	landings															
Ghana	Task I	grt														
	annual reports	unk	23			4	10									37
	landings		28972	720			22703									52395

Grenada	Task I	grt									
		loa				876					876
	landings					1141					1141
Guyana	Task I	grt		763		20		366			1149
		loa		812		100					912
	annual reports	unk									
	landings			2552							2552
Iceland	survey	unk									
	landings							1			1
Japan	Task I	grt									
	annual reports	unk				214					214
	survey	unk									
	landings					26333					26333
Libya	annual reports	unk				9	30		1		40
	survey	unk									
	landings					207	1140				1347
Maroc	annual reports	unk				545		1067			1612
	survey	unk									
	landings			1095	1020	7149	597	2067		1779	13707
Mexico	Task I	grt				30					30
		loa				30					30
	annual reports	unk				30					30
	landings					10500					10500
Namibia	Task I	grt	48			26					74
		loa	48			26					74
	landings		2482			13644					16126
NEI (ETRO)	landings						15492				15492
Panama	Task I	grt				33					33
		loa				33					33
	landings					3254	25410				28664

Philippines	Task I	grt				10										10
		loa				10										10
	annual reports	unk														
	landings					2092										2092
Russian Federation	Task I	grt					0				0					0
		loa					1				3					4
	survey	unk														
	landings						435				345					780
Senegal	Task I	grt	7													7
		loa	7													7
	annual reports	loa														
		unk	7				3									10
	survey	unk														
	landings		6063													6063
South Africa	Task I	grt	145	4		15		29				6				199
		loa	145	4		15		29				6				199
	annual reports	unk				15		30								45
	survey	unk														
	landings		3961			679		891								5531
St. Vincent and Grenadines	landings					3880				255						4135
Sta. Lucia	Task I	loa									690					690
	landings									463	193					656
Trinidad and Tobago	Task I	grt														
		loa														
	annual reports	loa														
		unk														
	survey	unk														
	landings					552		2			3395					3949

Tunisie	Task I	grt														
		loa														
	annual reports	loa														
		unk														
	landings															
Turkey	Task I	grt						75								75
	landings						410	32830								33240
U.S.A.	Task I	grt		1	27	1	100	5				2	10			146
		loa		1	27	1	100	5				2	10			146
	survey	unk														
	landings			1389	328	31	5079	12	14948		2323	2	142	870	6	25130
UK.Bermuda	Task I	loa							206							206
	annual reports	unk											69			69
	survey	unk														
	landings						1		134							136
UK.Sta Helena	Task I	grt							12							12
		loa							12							12
	landings								520							520
Uruguay	Task I	grt					12									12
		loa					12									12
	annual reports	unk					12									12
	survey	unk														
	landings						1500									1500
Vanuatu	Task I	grt					15									15
		loa					15									15
	landings						2924									2924
Venezuela	annual reports	grt	8				34	8								50
	landings		1781	344			910	6934								9970
UK.Turks and Caicos	Task I	loa							1	21						22
	landings									2						2

S. Tomé e Príncipe	Task I	loa							50		50
	annual reports	loa		15					35		50
	landings			132		767	562				1461
China	annual reports	unk			33						33
Korea	annual reports	unk			8						8
	landings				2770						2770
Dominican Republic	landings										
EC.Latvia	landings										
Guatemala	landings					12709					12709
Netherlands Antilles	landings					5547					5547
Norway	landings		667	4	94	0		69	1	0	834
Saint Kitts and Nevis	landings										
UK.British Virgin Islands	landings										

Table 5. Number of bluefin fishing vessels by flag, fishing gear and vessel length categories.

		Length Category					
		<15m	*15 m*	*24 m*	*30 m*	*>40 m*	*Grand Total*
Gear Type	*Flag*						
DREDGES	EC.Greece	1					**1**
	EC.Ireland		2				**2**
	EC.Portugal	1					**1**
DREDGES Total		**2**	**2**				**4**
GILLNETS AND ENTANGLING NETS	Croatia	9					**9**
	EC.Denmark		1				**1**
	EC.España	120	77	5			**202**
	EC.France	13	11				**24**
	EC.Greece	126	21				**147**
	EC.Ireland	1	7	7	3		**18**
	EC.Italy	6	2				**8**
	EC.Malta	4					**4**
	EC.Portugal		3		1		**4**
	Turkey					1	**1**
GILL. AND ENT. NETS Total		**279**	**122**	**12**	**4**	**1**	**418**
HOOKS AND LINES	Algerie		1				**1**
	China, P.R.					4	**4**
	Croatia	8					**8**
	EC.Cyprus			1			**1**
	EC.España	63	111	78	7		**259**
	EC.France	6	1				**7**
	EC.Greece	123	30				**153**
	EC.Italy	10	11	2			**23**
	EC.Malta	54	17	2			**73**
	EC.Portugal	7	4	1	2		**14**
	Japan					38	**38**
	Libya					4	**4**
	Tunisie				1		**1**
HOOKS AND LINES Total		**271**	**175**	**84**	**10**	**46**	**586**
SEINE NETS	EC.España	1					**1**
	EC.Greece	1	1				**2**
	EC.Italy	1					**1**
	Tunisie		13	14	6		**33**
SEINE NETS Total		**3**	**14**	**14**	**6**		**37**
SURROUNDING NETS	Croatia	1	29	25	6		**61**
	EC.España	9	38	62	56	2	**167**
	EC.France	5	8	6	16	11	**46**
	EC.Greece	7	17	2			**26**
	EC.Ireland		4	2			**6**
	EC.Italy	3	18	14	16	20	**71**
	EC.Malta	7	3	2			**12**
	EC.Portugal	1	1				**2**
	Libya		1	14	18	1	**34**
	Tunisie	1	2				**3**
	Turkey			2	24	24	**50**
SURROUNDING NETS Total		**34**	**121**	**129**	**136**	**58**	**478**
TRAPS	EC.España	3					**3**
	EC.France	1					**1**
	EC.Greece	9	1				**10**
	EC.Portugal	1	1	1			**3**
TRAPS Total		**14**	**2**	**1**			**17**
TRAWL NETS	EC.España	1		22	10		**33**
	EC.France	3	87	10	6		**106**
	EC.Greece	1	2	2	1		**6**
	EC.Ireland	2	8	8	1	2	**21**
	EC.Italy	2	6	3	3		**14**
	Turkey		1		13	12	**26**
TRAWL NETS Total		**9**	**104**	**45**	**34**	**14**	**206**
GRAND TOTAL		**612**	**540**	**285**	**190**	**119**	**1746**

Table 6. Number of bluefin farming vessels by flag, fishing gear and vessel length categories.

		Length Category					
Vessel Type	*Flag*	*<15m*	*15m*	*24m*	*30m*	*>30m*	*Grand Total*
DREDGERS	EC.Greece	1					**1**
DREDGERS Total		**1**					**1**
GILL NETTERS	EC.España	10	4				**14**
	EC.Greece	120	17				**137**
	EC.Malta	1					**1**
	EC.Portugal		3		1		**4**
GILL NETTERS Total		**131**	**24**		**1**		**156**
LINE VESSELS	EC.España	15	46	7			**68**
	EC.Portugal	7	4	1	1		**13**
LINE VESSELS Total		**22**	**50**	**8**	**1**		**81**
LONGLINER	EC.Cyprus			1			**1**
	EC.España		1				**1**
	EC.France	2					**2**
	EC.Greece	128	34				**162**
	EC.Italy	9	13	2			**24**
	EC.Malta	58	17	2			**77**
	EC.Portugal				1		**1**
	Libya					2	**2**
LONGLINER Total		**197**	**65**	**5**	**1**	**2**	**270**
OTHER SEINERS	EC.Greece	3	1				**4**
	EC.Malta	4	3				**7**
OTHER SEINERS Total		**7**	**4**				**11**
PURSE SEINERS	Croatia	1	9	13	5		**28**
	EC.España	5	3	10	42	2	**62**
	EC.France		3	6	15	12	**36**
	EC.Greece	4	17	2			**23**
	EC.Italy	11	18	14	15	21	**79**
	EC.Malta	2		2			**4**
	EC.Portugal		1				**1**
	Libya		1	14	18	1	**34**
	Tunisie		13	14	7		**34**
	Turkey			2	21	27	**50**
PURSE SEINERS Total		**23**	**65**	**77**	**123**	**63**	**351**
TRAP SETTERS	EC.Greece	11	1				**12**
	EC.Portugal	2	1	1			**4**
TRAP SETTERS Total		**13**	**2**	**1**			**16**
TRAWLERS	EC.France		1				**1**
	EC.Greece		2	2	1		**5**
	EC.Italy	2	6	3	3		**14**
	Turkey		1		13	12	**26**
TRAWLERS Total		**2**	**10**	**5**	**17**	**12**	**46**
TROLLERS	EC.Greece	1					**1**
TROLLERS Total		**1**					**1**
GRAND TOTAL		**397**	**220**	**96**	**143**	**77**	**933**

Table 7. Hold capacity (t) of bluefin fishing vessels by flag, fishing gear and vessel GRT categories.

Gear Type	*Flag*	*GRT Category*					
		<50t	*50t*	*100t*	*200t*	*>300t*	*Grand Total*
DREDGES	EC.Greece	4					**4**
	EC.Ireland		129				**129**
	EC.Portugal	12					**12**
DREDGES Total		**17**	**129**				**146**
GILLNETS AND ENTANGLING NETS	Croatia	57					**57**
	EC.Denmark	20					**20**
	EC.España	3365	651				**4016**
	EC.France	245	462	323			**1031**
	EC.Greece	1232					**1232**
	EC.Ireland	35	242	1200	453	1597	**3527**
	EC.Italy	71					**71**
	EC.Malta	27					**27**
	EC.Portugal	35	135	188			**358**
	Turkey	7					**7**
GILL. AND ENT. NETS Total		**5093**	**1491**	**1712**	**453**	**1597**	**10346**
HOOKS AND LINES	Algerie		54				**54**
	China, P.R.					2599	**2599**
	Croatia	64					**64**
	EC.Cyprus			108			**108**
	EC.España	3033	6590	4944			**14567**
	EC.France	92					**92**
	EC.Greece	1882	170				**2052**
	EC.Italy	373	111	251			**735**
	EC.Malta	1429	543	102			**2074**
	EC.Portugal	262	166	494			**922**
	Japan					16336	**16336**
	Libya				300	1352	**1652**
	Tunisie				237		**237**
HOOKS AND LINES Total		**7136**	**7634**	**5898**	**537**	**20287**	**41491**
SEINE NETS	EC.España	9					**9**
	EC.Greece	40					**40**
	EC.Italy	6					**6**
	Tunisie	34	1325	1356	1481		**4196**
SEINE NETS Total		**89**	**1325**	**1356**	**1481**		**4251**
SURROUNDING NETS	Croatia	415	1478	3911	238	426	**6469**
	EC.España	1017	4240	10227	964		**16448**
	EC.France	283	363	1368	3608	2753	**8376**
	EC.Greece	542	346				**888**
	EC.Ireland		93	123	893		**1108**
	EC.Italy	565	1699	2727	2729		**7721**
	EC.Malta	211	95	116			**421**
	EC.Portugal	7	64				**71**
	Libya	50	496	2589	2010		**5144**
	Tunisie	68	87				**155**
	Turkey	7	182	323	9015	4409	**13936**
SURROUNDING NETS Total		**3165**	**9143**	**21384**	**19458**	**7588**	**60738**
TRAPS	EC.España	20					**20**
	EC.France	16					**16**
	EC.Greece	93					**93**
	EC.Portugal	39	100				**139**
TRAPS Total		**168**	**100**				**268**
TRAWL NETS	EC.España	10		4443			**4453**
	EC.France	1832	3054	2366	1366		**8619**
	EC.Greece	31	319				**350**
	EC.Ireland	48	52	1757	714	2095	**4666**
	EC.Italy	160	246	526			**932**
	Turkey	34		771	3718	2792	**7315**
TRAWL NETS Total		**2116**	**3671**	**9863**	**5797**	**4887**	**26334**
GRAND TOTAL		**17784**	**23492**	**40213**	**27726**	**34359**	**143573**

Table 8. Hold capacity (t) of bluefin farming vessels by flag, fishing gear and vessel GRT categories.

Vessel Type	*Current Flag*	*GRT Category*						
		<20t	*20t*	*50t*	*100t*	*200t*	*>300t*	*Grand Total*
DREDGERS	EC.Greece	4						**4**
DREDGERS Total		**4**						**4**
GILL NETTERS	EC.España	120	127					**246**
	EC.Greece	875	270					**1146**
	EC.Malta	11						**11**
	EC.Portugal		35	135		188		**358**
GILL NETTERS Total		**1006**	**432**	**135**		**188**		**1761**
LINE VESSELS	EC.España	363	792	1342				**2496**
	EC.Portugal	18	244	166		315		**743**
LINE VESSELS Total		**381**	**1036**	**1508**		**315**		**3239**
LONGLINER	EC.Cyprus				108			**108**
	EC.España		37					**37**
	EC.France	10						**10**
	EC.Greece	1098	865	170				**2133**
	EC.Italy	122	262	111	251			**746**
	EC.Malta	511	944	543	102			**2099**
	EC.Portugal					179		**179**
	Libya						693	**693**
LONGLINER Total		**1740**	**2108**	**824**	**460**	**179**	**693**	**6005**
OTHER SEINERS	EC.Greece	29	26					**55**
	EC.Malta	58	100					**158**
OTHER SEINERS Total		**88**	**126**					**213**
PURSE SEINERS	Croatia		123	458	1557	700	664	**3502**
	EC.España	67	54	199	6390	747	559	**8016**
	EC.France		126	265	124	1073	6361	**7950**
	EC.Greece	51	468	346				**865**
	EC.Italy	125	505	1699	980	1747	2729	**7786**
	EC.Malta	35		95	116			**245**
	EC.Portugal			64				**64**
	Libya		50	496	1580	1008	2010	**5144**
	Tunisie		34	1325	994	735	1258	**4346**
	Turkey	14		182	146	177	13204	**13723**
PURSE SEINERS Total		**292**	**1360**	**5128**	**11888**	**6187**	**26786**	**51640**
TRAP SETTERS	EC.Greece	84	21					**105**
	EC.Portugal	22	25	100				**147**
TRAP SETTERS Total		**106**	**46**	**100**				**252**
TRAWLERS	EC.France		29					**29**
	EC.Greece		29	319				**348**
	EC.Italy	38	123	246	363	162		**932**
	Turkey		34		239	532	6510	**7315**
TRAWLERS Total		**38**	**215**	**565**	**602**	**694**	**6510**	**8624**
TROLLERS	EC.Greece	4						**4**
TROLLERS Total		**4**						**4**
GRAND TOTAL		**3660**	**5322**	**8259**	**12951**	**7563**	**33988**	**71743**

Table 9. Number of vessels by country that target North Atlantic albacore included in the ICCAT list of vessels [Rec.98-08].

Country	*1999*	*2000*	*2001*	*2002*	*2003*	*2004*	*2005*	*2006*	*2007*
CANADA	72	77	77	77	78	78	78	76	77
CHINESE TAIPEI	27	27	19	19	17	14	14	13	13
U.S.A.	424	455	454	335	192	308	385	379	262
EC	1000	943	1141	1253	1227	1207	1235	1199	1194
Total	1523	1502	1691	1684	1514	1607	1712	1667	1546

Table 10. Type of listed vessels by length (m) and GRT (t) by country and year.

	YEAR	**COUNTRY**							
Type vessel	**2004**	CANADA	CHINA-TAIP	EC-FR	EC-IRE	EC-PORT	EC-SPAIN	EC-UK	USA
Mín Length (m)		12	22	13	23	6	7		5
Máx Length (m)		30	49	77	23	38	38		38
Mean Length (m)		15	37	21	23	11	20		18
Mín GRT (mt)			71	18	21	0.5	2		5
Máx GRT (mt)			437	407	335	545	422		187
Mean GRT (mt)			258	111	141	38	59		61
Total GRT	**94174.49**								
	2005	CANADA	CHINA-TAIP	EC-FR	EC-IRE	EC-PORT	EC-SPAIN	EC-UK	USA
Mín Length (m)		12	22	13	17	4	7	17	4
Máx Length (m)		30	49	35	41	46	38	39	38
Mean Length (m)		15	37	21	24	14	20	30	17
Mín GRT (mt)			71	20	52	1	2		1
Máx GRT (mt)			437	233	322	337	279		195
Mean GRT (mt)			258	78	129	44	58		55
% fleet			100	100	62	100	100		63
Total GRT	**87699.59**								
	2006	CANADA	CHINA-TAIP	EC-FR	EC-IRE	EC-PORT	EC-SPAIN	EC-UK	USA
Mín Length (m)		29	25	13		4	6	17	4
Máx Length (m)		34	58	35		46	38	49	45
Mean Length (m)		31	44	21		14	20	28	16
Mín GRT (mt)		199	75	20		1	2		1
Máx GRT (mt)		298	778	233		337	264		200
Mean GRT (mt)		258	471	79		44	61		43
Total GRT	**87709.81**								
	2007	CANADA	CHINA-TAIP	EC-FR	EC-IRE	EC-PORT	EC-SPAIN	EC-UK	USA
Mín Length (m)		11	22	12	20	4	6	17	4
Máx Length (m)		34	54	38	41	46	38	49	38
Mean Length (m)		16	32	21	28	15	20	28	17
Mín GRT (mt)		195	71	9	84	0	2		1
Máx GRT (mt)		298	709	268	624	337	264		298
Mean GRT (mt)		261	232	81	272	43	61		46
Total GRT	**87674.24**								

Table 11. Patterns of relative effort levels estimated from Task II data for the Mediterranean gillnet and longline fleets harvesting swordfish.

Stock	*F/F_{MSY}*	*Year assessed*
BFT-E	3.1	2006
BFT-W	1.7	2006
BUM	>1	2006
ALB-N	1.5	2007
SWO-M	1.3-2.9	2007
WHM	>1?	2006
YFT	1.1	2003

Table 12. ICCAT quotas or catch limits, and catches, by stock and flag. Only stocks for which the last assessment indicated that $F>F_{MSY}$ and that are managed through quotas/limits are included. The data were obtained from the 2007 Commission meeting's Compliance Tables which contain quotas and declared catches for compliance purposes. Cases in which Catch>Quota are highlighted in boldface and indicate that overcapacity may exist.

ALB N

YEAR		*2004*	*2005*	*2006*	*2007*	*2008*
BARBADOS	Limit	200	200	200	200	200
	Catch	8	11	9		
BELIZE	Limit		100	200	200	200
	Catch		0	0		
BRAZIL	Limit	200	200	200	200	200
	Catch	0	0	0		
CANADA	Limit	200	200	200	200	200
	Catch	27	52	27		
CHINA	Limit	200	200	200	200	200
	Catch	32	112	**202**		
EUROPEAN COMMUNITY	Limit	28712	28712	28712	28712	25462
	Catch	16913	**34948**	**29232**		
FRANCE (St. P & M)	Limit	200	200	200	200	200
	Catch	7	2	0		
JAPAN (% BET)	Limit	4%	4%	4%	4%	4%
	Catch	**8.1%**	**6.7%**	**5.7%**		
KOREA	Limit	200	200	200	200	200
	Catch		59	31		
MAROC	Limit	200	200	200	200	200
	Catch	120	178	98		
TRINIDAD & TOBAGO	Limit	200	200	200	200	200
	Catch	12	9	12		
UKOT	Limit	200	200	200	200	200
	Catch	1	1	0		
USA	Limit	607	607	607	607	538
	Catch	**628**	487	396		
VANUATU	Limit		200	200	200	200
	Catch	**414**	**507**	**235**		
VENEZUELA	Limit	270	270	270	270	250
	Catch	**457**	175	**321**		
CHINESE TAIPEI	Limit	4453	4453	4453	4453	3950
	Catch	4278	2540	2357		

BFT E

YEAR		*2003*	*2004*	*2005*	*2006*	*2007*
ALGERIE	Limit	1500.0	1550.0	1600.0	1700.0	1511.27

	Catch	**1586.0**	1541.0	1530.0	1698.0	
CHINA	Limit	74.0	74.0	74.0	74.0	65.78
	Catch	19.3	41.0	23.7	42.0	
CROATIA	Limit	900.0	935.0	945.0	970.0	862.31
	Catch	**1139.0**	827.0	**1017.0**	**1022.6**	
EUROPEAN COMMUNITY	Limit	18582.0	18450.0	18331.0	18301.0	16779.55
	Catch	16607.3	17284.3	**20600.3**	**19166.5**	
ICELAND	Limit	30.0	40.0	50.0	60.0	53.34
	Catch	0.0	0.0	0.0	0.0	
JAPAN	Limit	2949.0	2930.0	2890.0	2830.0	2515.82
	Catch	2829.0	**2958.0**	**3022.0**	1760.0	
KOREA	Limit		2428.9	1728.9	741.9	177.80
	Catch	0.0	700.0	987.0	68.0	
LIBYA	Limit	1286.0	1300.0	1400.0	1440.0	1280.14
	Catch	752.2	1299.6	1090.7	1254.0	
MAROC	Limit	3030.0	3078.0	3127.0	3177.0	2824.30
	Catch	2557.0	2780.0	2497.0	2386.0	
TUNISIE	Limit	2503.0	2543.0	2583.0	2625.0	2333.58
	Catch	792.0	**2639.0**	**3249.0**	2545.0	
NORWAY	Limit	Fishing under "others" quota				53.34
	Catch		0.0	0.0	0.0	
SYRIA	Limit					53.34
	Catch					
TURKEY	Limit	Fishing under "others" quota				918.32
	Catch	3300.0	1075.0	990.0	806.0	
EC-MALTA	Limit	Fishing under "others" quota				
	Catch	255.2	264.2	345.6	263.0	
EC-CYPRUS	Limit	Fishing under "others" quota				
	Catch	78.9	104.7	148.8	110.0	
CHINESE TAIPEI	Limit	827.0	382.0	331.0	480.0	71.12
	Catch	445.0	51.0	277.0	9.0	

BFT W

YEAR		*2003*	*2004*	*2005*	*2006*	*2007*
CANADA	Limit	620.2	620.2	620.2	620.2	546.4
	Catch	556.6	536.9	599.7	**732.9**	
FRANCE (St. P & M)	Limit	4.0	4.0	4.0	4.0	4.0
	Catch	0.9	**9.8**	**4.9**	0.0	
JAPAN	Limit	478.3	478.3	478.3	478.3	380.5
	Catch	376.0	460.0	**592.0**	245.6	
MEXICO	Limit	25.0	25.0	25.0	25.0	100.0
	Catch	22.0	9.0	10.0	14.0	
UKOT	Limit	4.0	4.0	4.0	4.0	4.0
	Catch	0.3	0.0	0.0	0.0	
USA	Limit	1489.6	1489.6	1489.6	1489.6	1190.0
	Catch	1472.9	863.2	687.8	468.0	

BUM

		2003	*2004*	*2005*	*2006*	*2007*
BARBADOS	Limit	9.5	9.5	9.5	9.5	9.5
	Catch	0.0	0.0	0.0	0.0	
BRAZIL	Limit	254.5	254.5	254.5	254.5	254.5
	Catch	**577.4**	194.8	**611.6**	**297.6**	
CHINA	Limit	100.5	100.5	100.5	100.5	100.5
	Catch	88.5	58.4	96.3	99.0	
EUROPEAN COMMUNITY	Limit	103.0	103.0	103.0	103.0	103.0
	Catch	43.0	77.0	47.0	**166.3**	
JAPAN	Limit	839.5	839.5	839.5	839.5	839.5

	Catch	453.0	458.0	558.0	539.0	
KOREA	Limit	72.0	72.0	72.0	72.0	72.0
	Catch	0.0	0.0	36.0	6.0	
MAROC	Limit	0.0	0.0	0.0	0.0	0.0
	Catch	0.0	0.0	**12.0**	0.0	
MEXICO	Limit	17.5	17.5	17.5	17.5	17.5
	Catch	**70.0**	**90.0**	**86.0**	**65.0**	
PHILIPPINES	Limit	35.5	35.5	35.5	35.5	35.5
	Catch	6.1	0.0	0.0	0.0	
SOUTH AFRICA	Limit	0.0	0.0	0.0	0.0	0.0
	Catch	**4.0**	**0.4**	0.0	**1.9**	
TRINIDAD & TOBAGO	Limit	10.3	10.3	10.3	10.3	10.3
	Catch	3.4	10.1	5.0	**11.4**	
VENEZUELA	Limit	30.4	30.4	30.4	30.4	30.4
	Catch	23.7	26.0	29.0	12.0	
CHINESE TAIPEI	Limit	330.0	330.0	330.0	330.0	330.0
	Catch	319.0	315.0	151.0	99.0	
USA(# of fish whm+bum)	Limit	250	250	250	250	
	Catch	114	95	143	130	

WHM

		2003	*2004*	*2005*	*2006*	*2007*
BRAZIL	Limit	52.0	52.0	52.0	52.0	52.0
	Catch	**265.6**	**80.5**	**243.7**	**89.7**	
CANADA	Limit	2.6	2.6	2.6	2.6	2.6
	Catch	1.3	1.4	**4.7**	**3.2**	
CHINA	Limit	9.9	9.9	9.9	9.9	9.9
	Catch	8.0	6.5	8.6	5.6	
EUROPEAN COMMUNITY	Limit	46.5	46.5	46.5	46.5	46.5
	Catch	27.0	**83.0**	30.0	**79.4**	
JAPAN	Limit	37.0	37.0	37.0	37.0	37.0
	Catch	31.0	30.0	**42.0**	32.0	
KOREA	Limit	19.5	19.5	19.5	19.5	19.5
	Catch	2.0	0.0	7.0	2.0	
MEXICO	Limit	3.6	3.6	3.6	3.6	3.6
	Catch	**15.0**	**28.0**	**25.0**	**16.0**	
PHILIPPINES	Limit	4.0	4.0	4.0	4.0	4.0
	Catch	0.0	0.0	0.0	0.0	
TRINIDAD & TOBAGO	Limit	0.0	0.0	0.0	0.0	0.0
	Catch	8.8	5.9	5.0	5.4	
VENEZUELA	Limit	50.0	50.0	50.0	50.0	50.0
	Catch	22.8	23.0	27.1	6.0	
CHINESE TAIPEI	Limit	186.8	186.8	186.8	186.8	186.8
	Catch	104.0	172.0	56.0	44.0	
USA(# of fish whm+bum)	Limit	250	250	250	250	
	Catch	114	95	143	130	

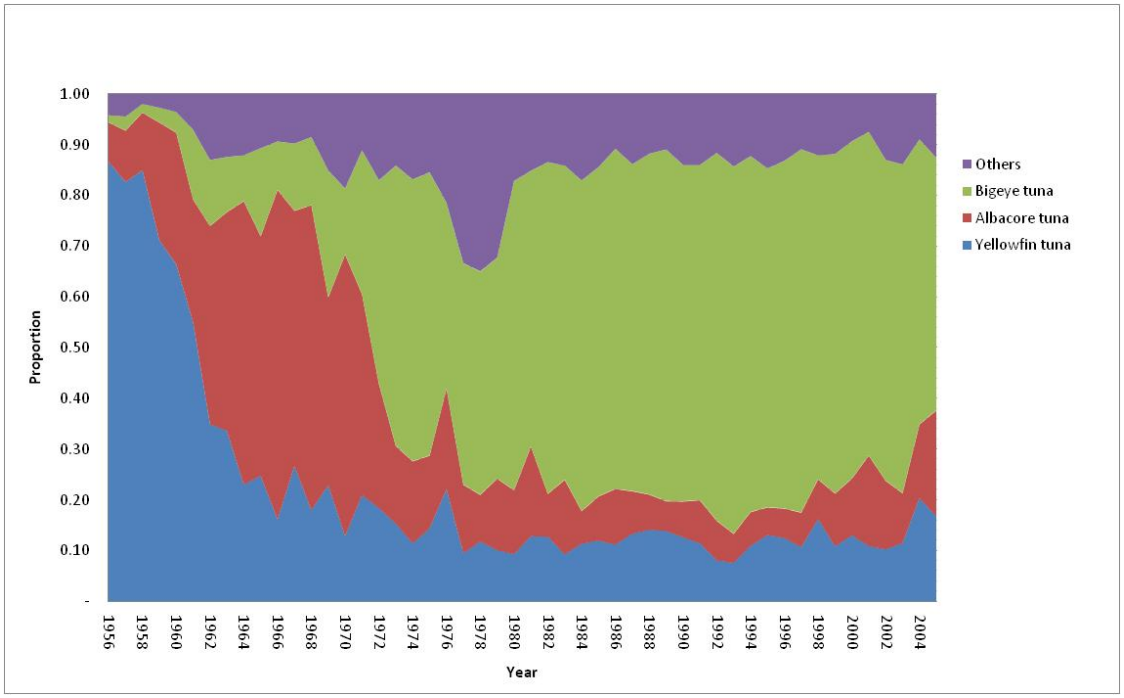


Figure 1. The proportion of species catches (in number of fish) for Japanese longline vessels within the ICCAT areas.

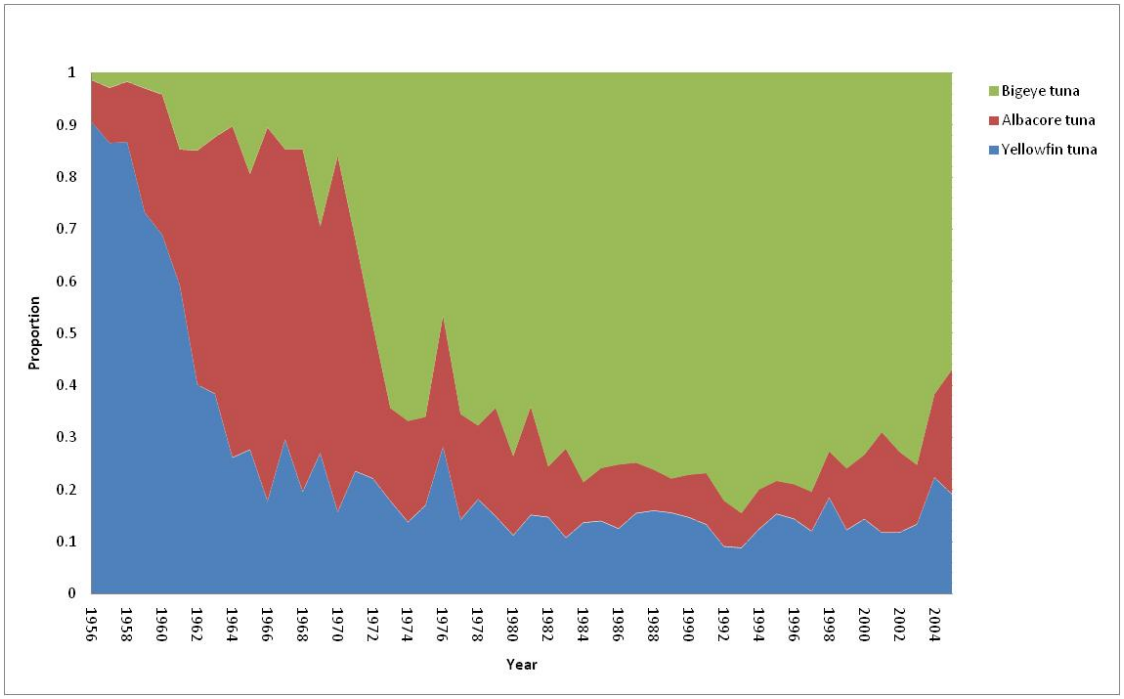


Figure 2. The proportion of target species catches (in number of fish) for Japanese longline vessels within the ICCAT areas.

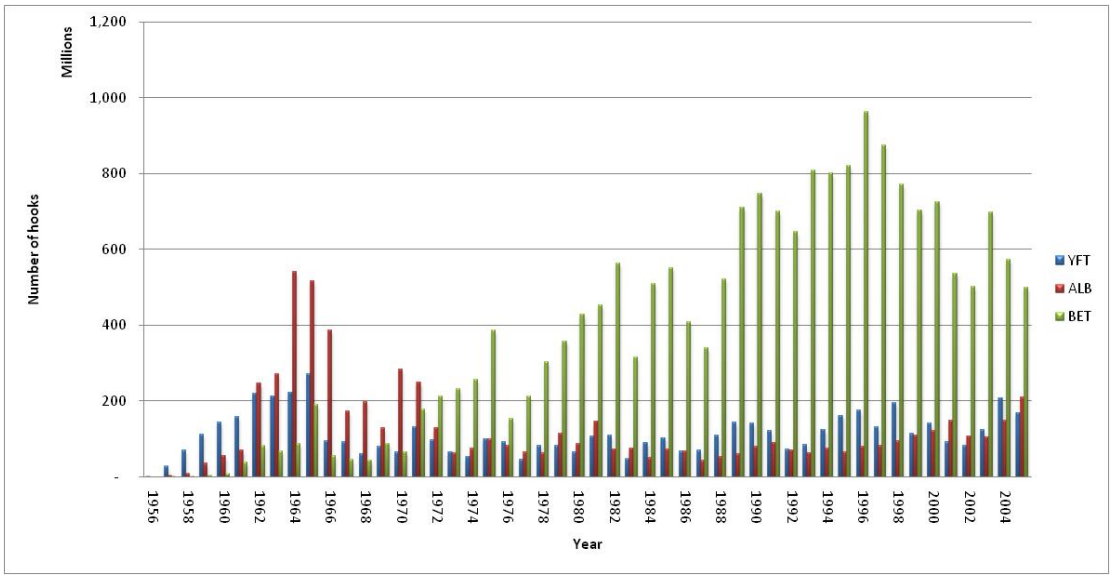


Figure 3. Estimated number of hooks for target species for Japanese longline operations (1956-2005).

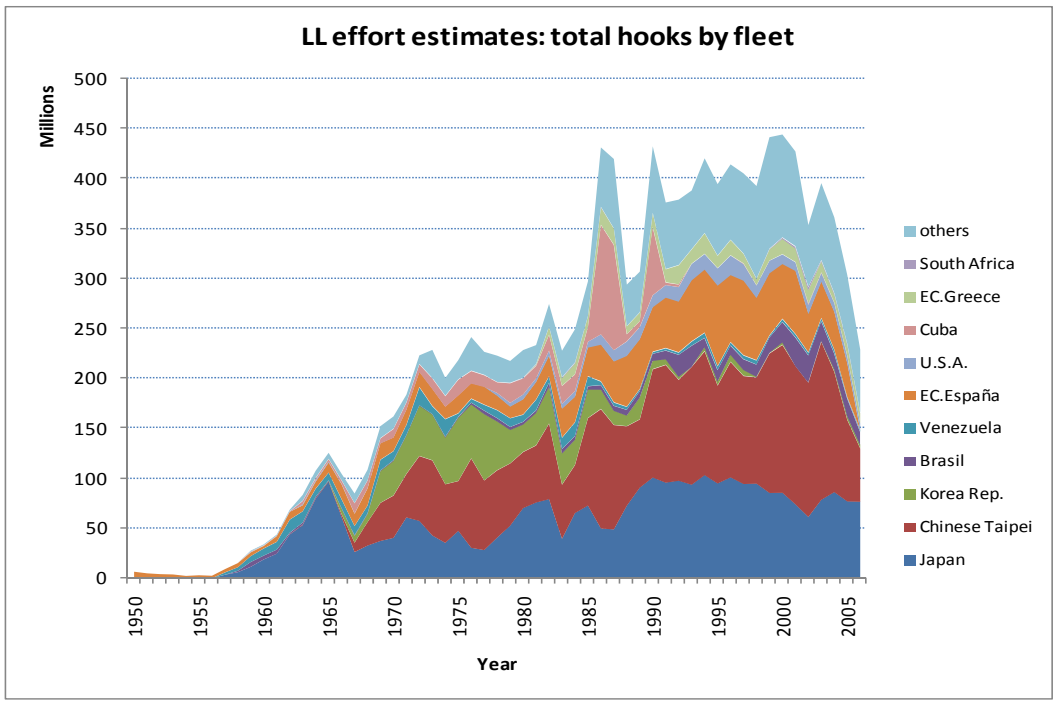


Figure 4. Total number of hooks by fleet, estimated based on the method used by the Sub-Committee on Ecosystems in 2007.

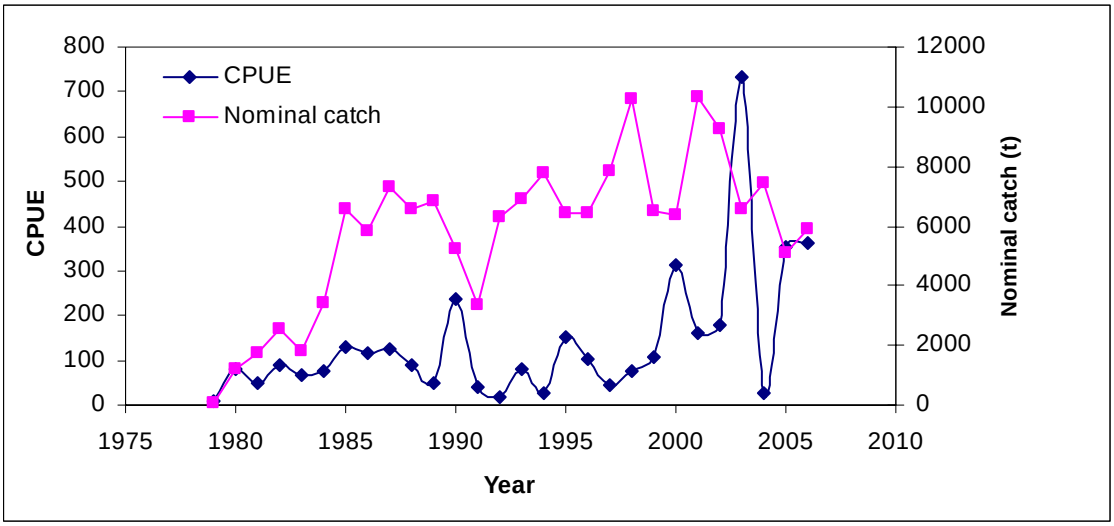


Figure 5. GLM standardized CPUE and nominal catch per year for temperate tuna species caught by baitboats operating in the southern hemisphere of the Atlantic Ocean.

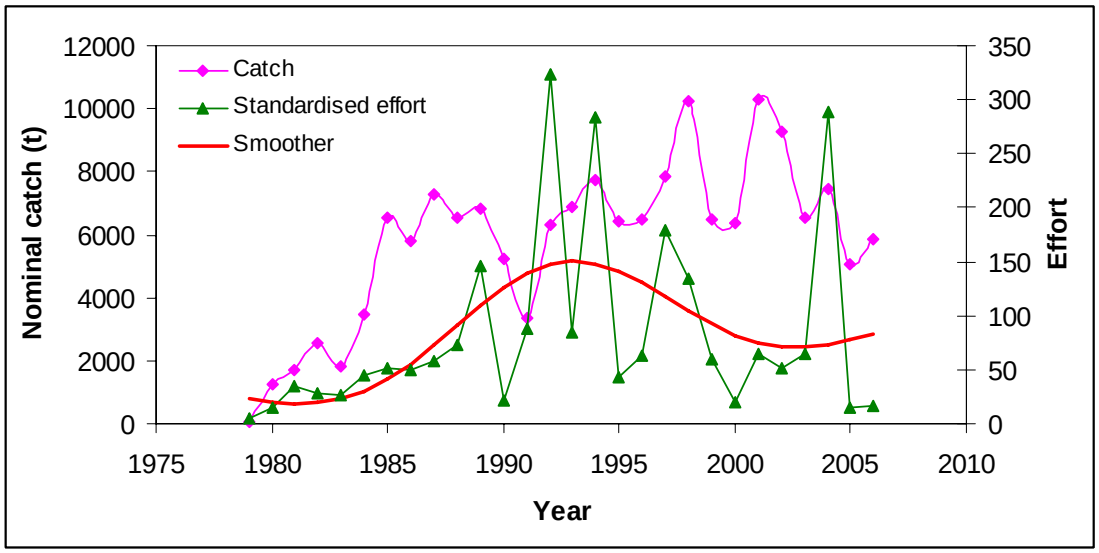
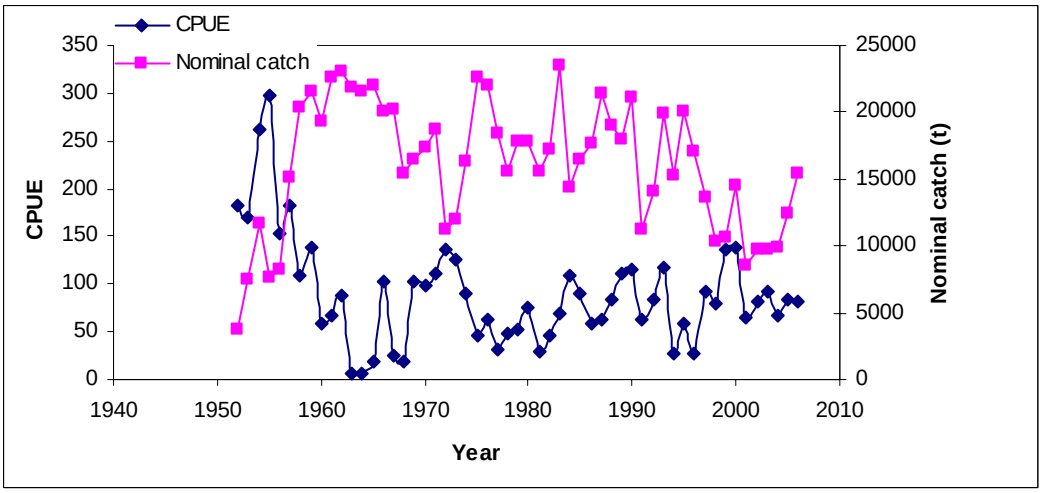
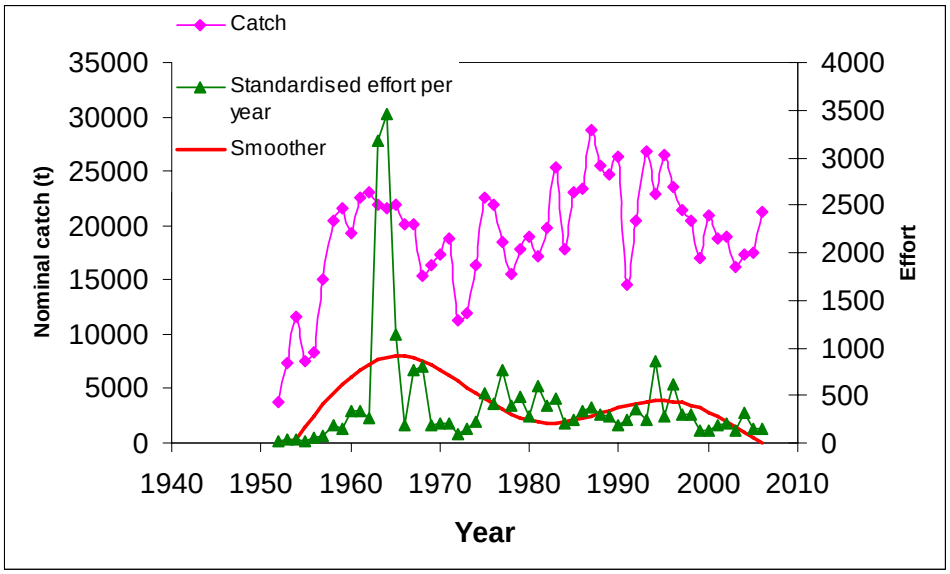


Figure 6. Nominal catch per year and estimates of standardized effort for temperate tuna species caught by baitboats operating in the southern hemisphere of the Atlantic Ocean.



Figures 7. GLM standardized CPUE and nominal catch per year for temperate tuna species caught by baitboats operating in the northern hemisphere of the Atlantic Ocean.



Figures 8. Nominal catch per year and estimates of standardized effort for temperate tuna species caught by baitboats operating in the northern hemisphere of the Atlantic Ocean.

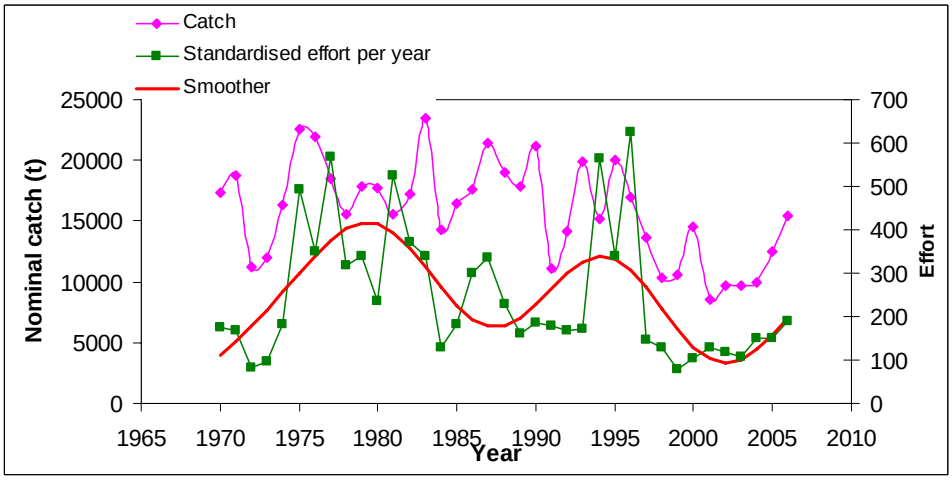


Figure 9. Nominal catch per year and estimates of standardized effort for temperate tuna species caught by baitboats operating in the northern hemisphere of the Atlantic Ocean after 1970.

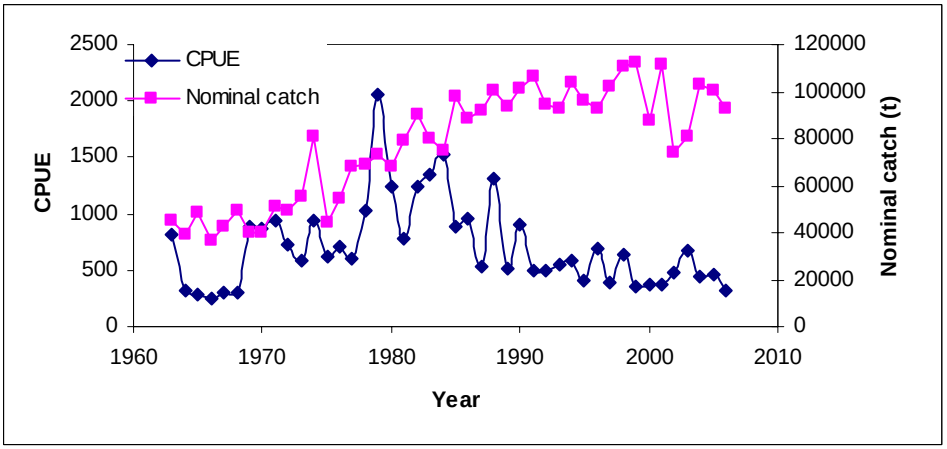


Figure 10. GLM standardized CPUE and nominal catch per year for tropical tuna species caught by baitboats operating in the Atlantic Ocean.

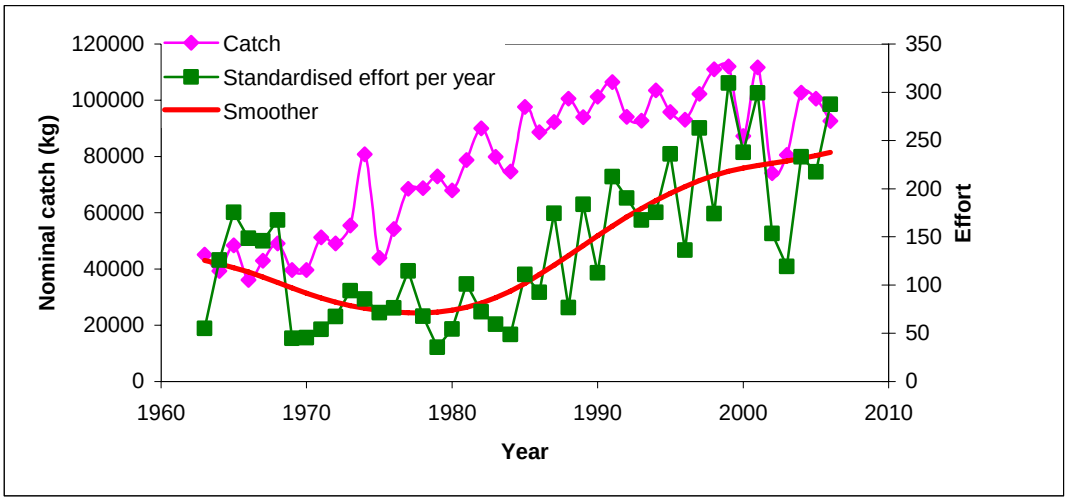


Figure 11. Nominal catch per year and estimates of standardized effort for tropical tuna species caught by baitboats operating in the Atlantic Ocean.

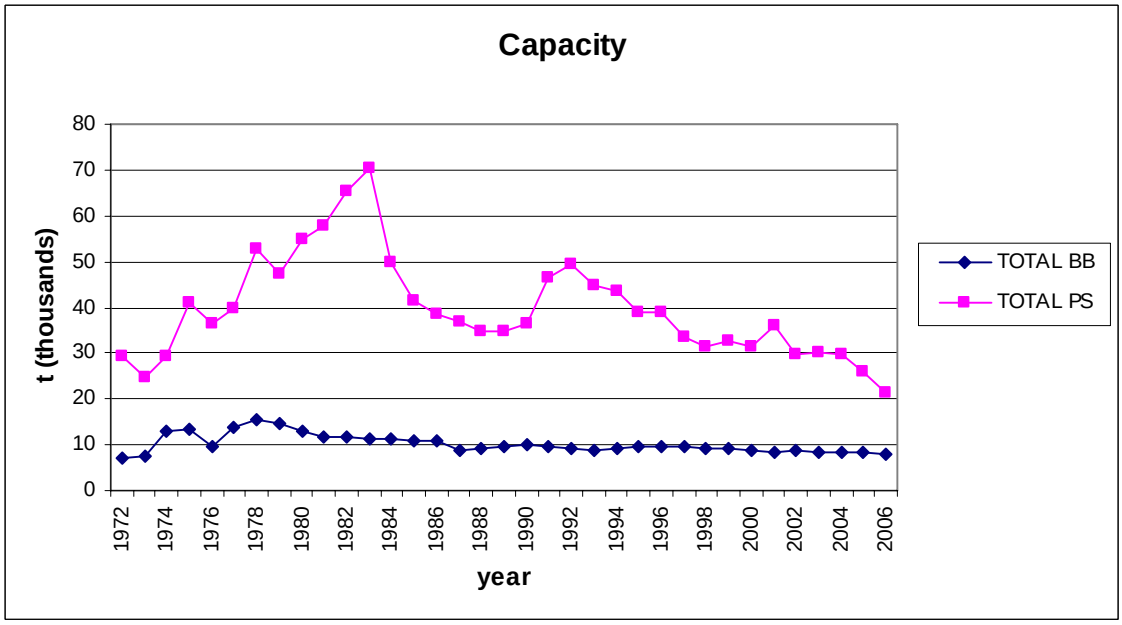


Figure 12. Change over time in carrying capacity (1000 t) for purse seiners and baitboats in the eastern Atlantic (1972-2006).

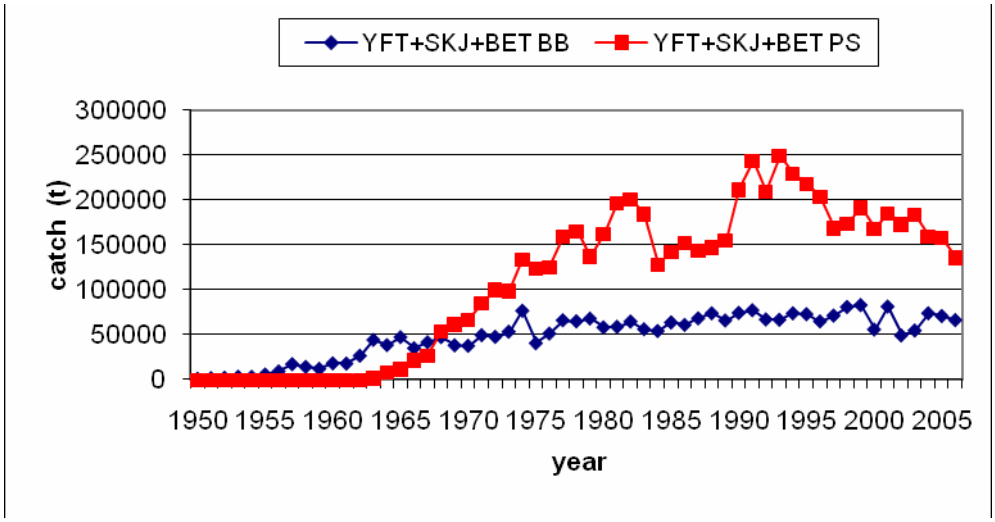


Figure 13. Total catch of tropical tunas for the surface fishery in the eastern Atlantic since the beginning of the fishery.

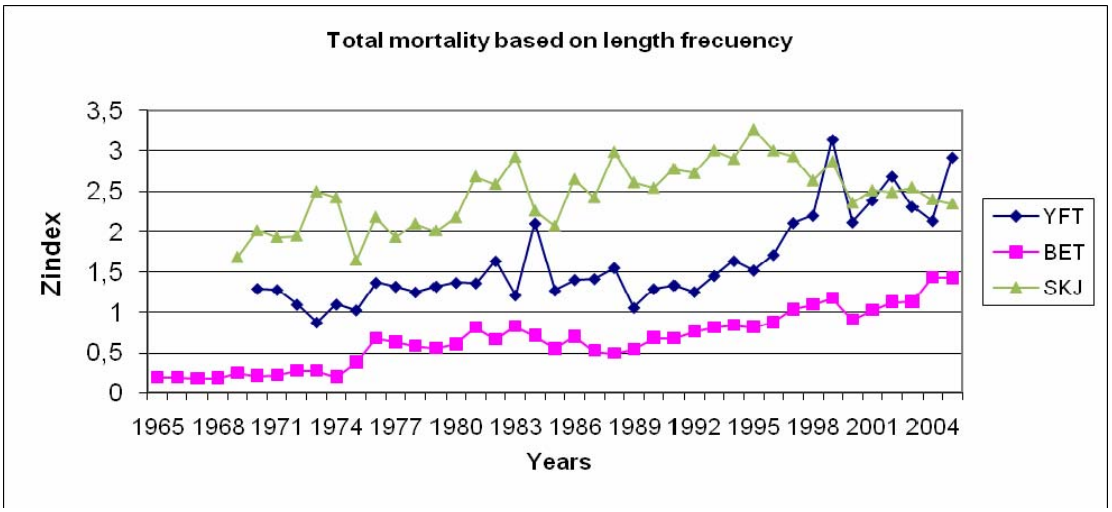


Figure 14. Change over the years in the total mortality Z for the three tropical species (YFT, BET and SKJ).

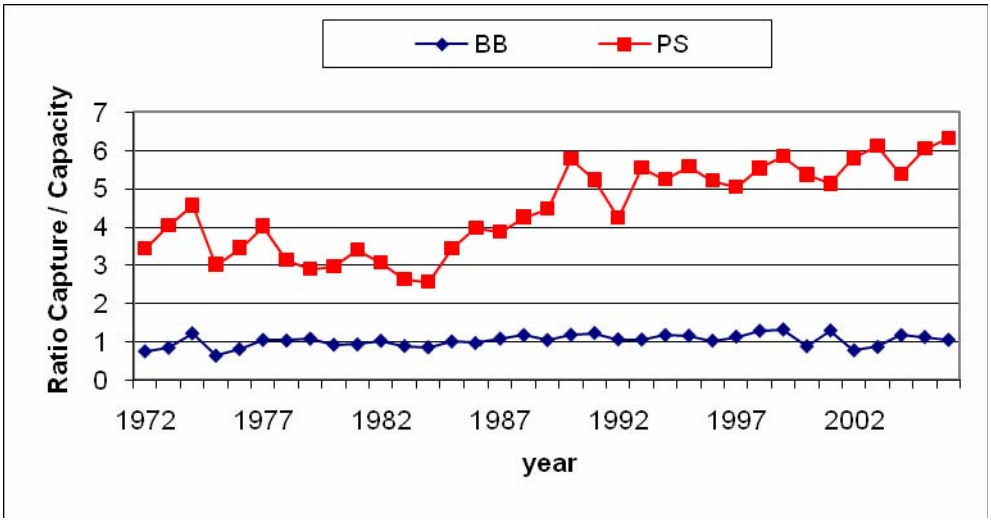


Figure 15. Change over time of the ratio total catch/capacity for the surface fishery (BB and PS) in the eastern Atlantic (1972-2006).

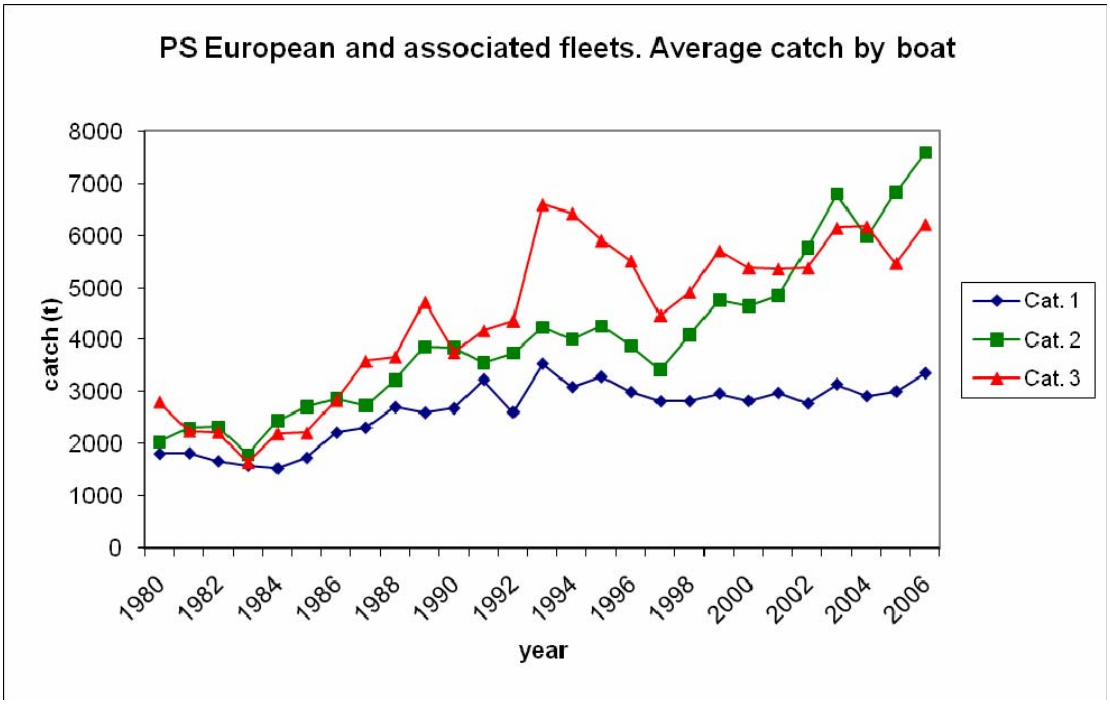


Figure 16. Average catch per year per vessel and by size class of carrying capacity (cat 1 <1000 m3; 1000 m3 >= cat 2 >1500 m3; cat 3 >= 1500 m3) for the ECpurse seiners.

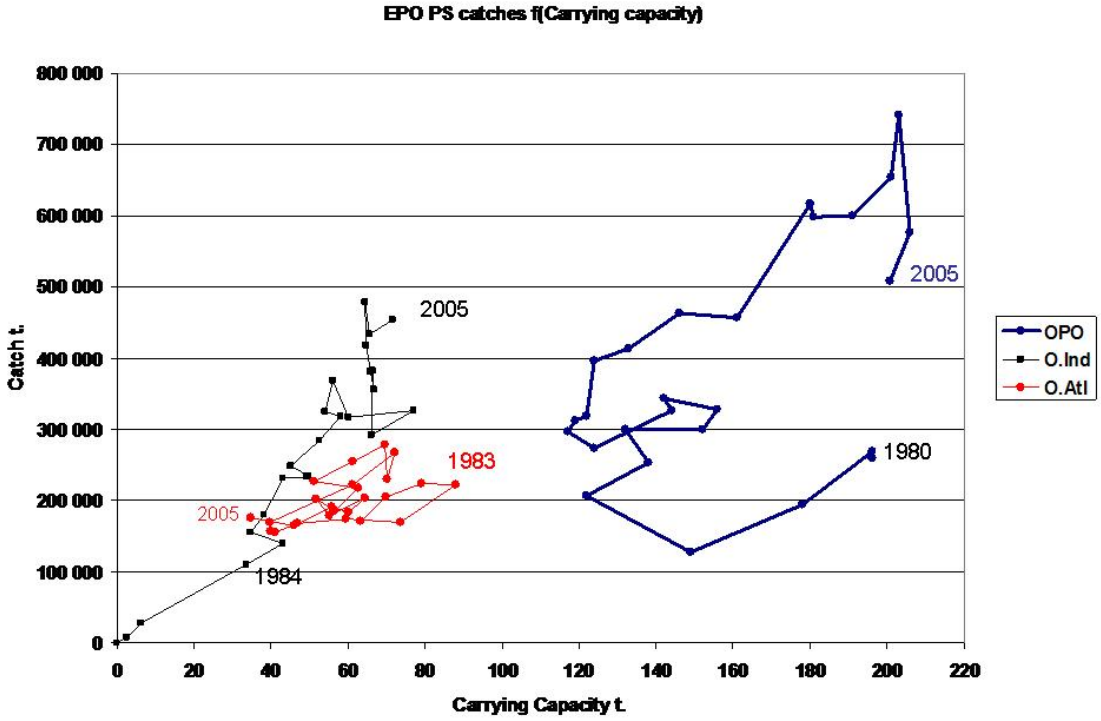


Figure 17. Relationship between carrying capacity of tropical purse seiners and their total yearly catches in the Atlantic (red or gray line). The Indian and eastern Pacific Oceans are also shown.

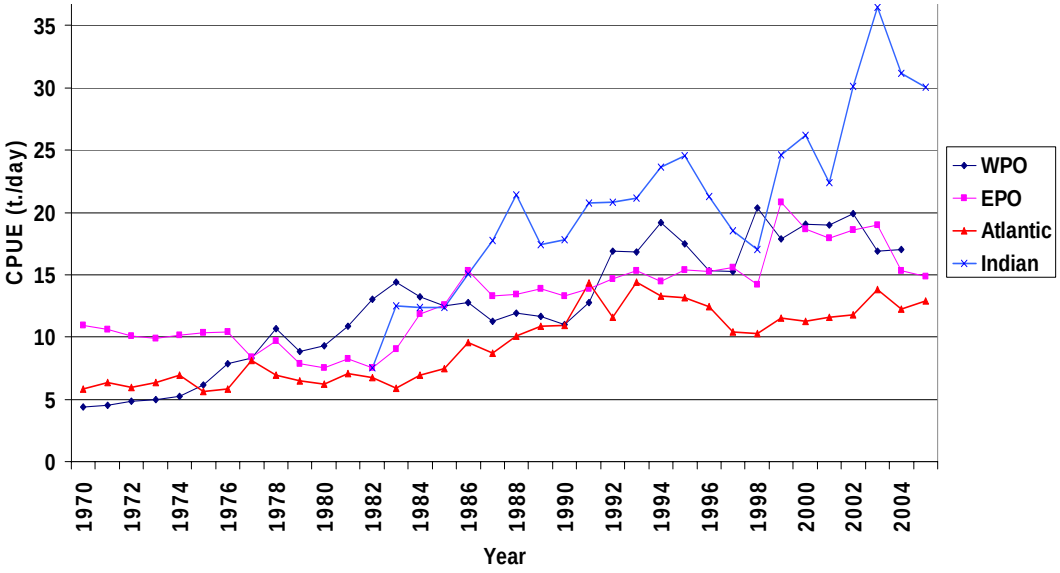


Figure 18. Nominal total CPUE of tropical purse seine fishing in the various oceans.

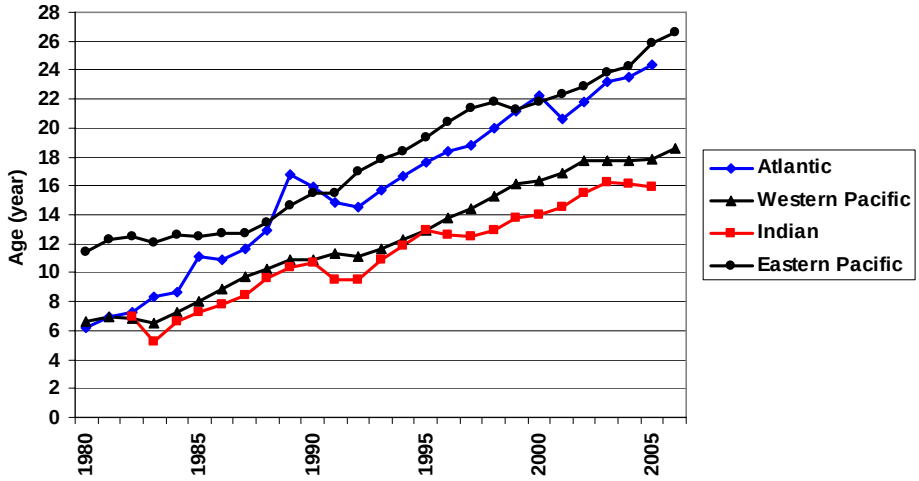


Figure 19. Average age of the tropical purse seine fleets fishing in the various oceans.

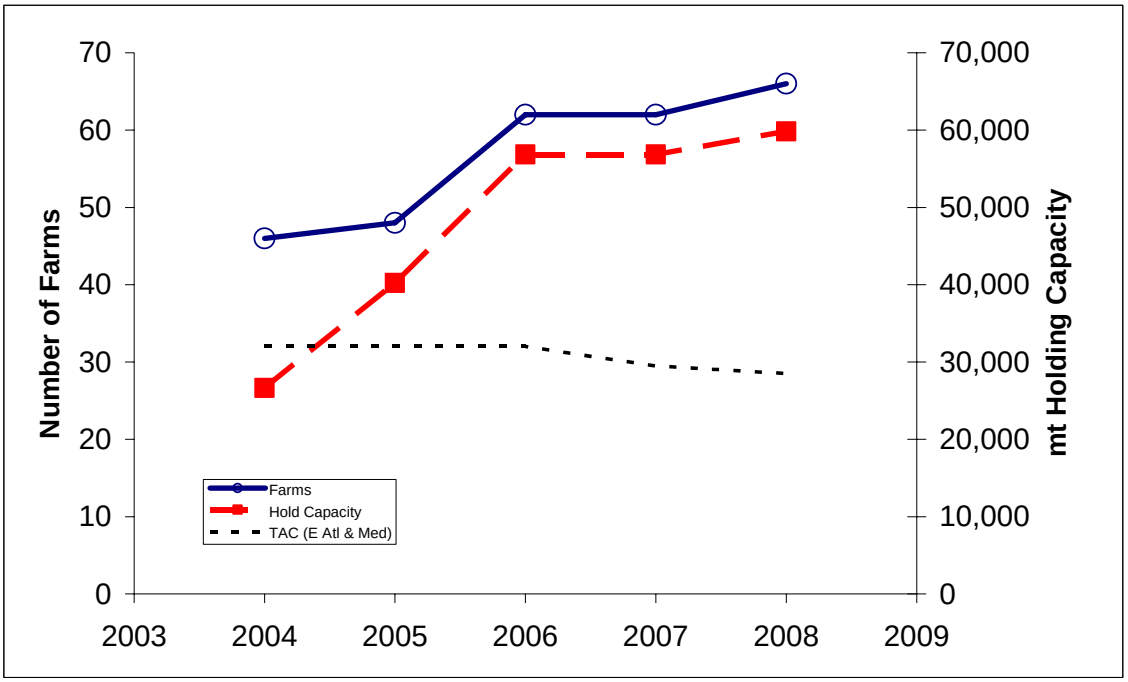


Figure 20. Estimated Mediterranean bluefin farm capacity and number of farms as reported by CPCs to the Secretariat. Agreed TACs for the time period are also indicated.

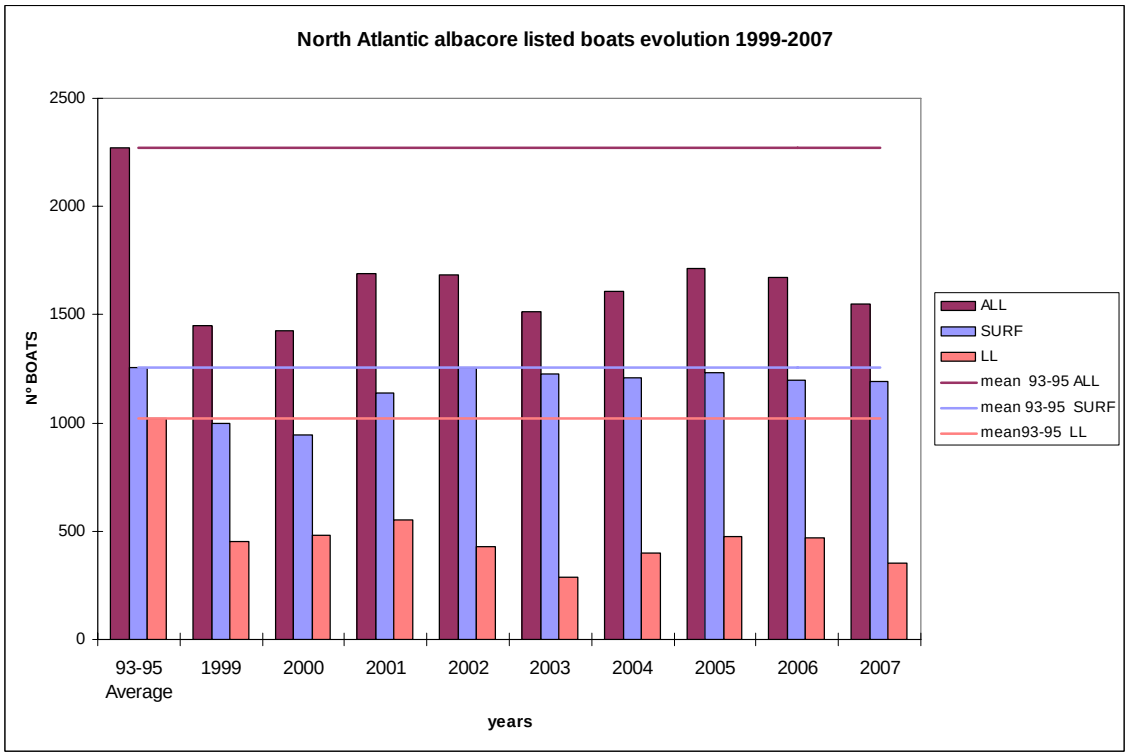


Figure 21. Number of vessels listed in ICCAT by application of [Rec. 98-08].

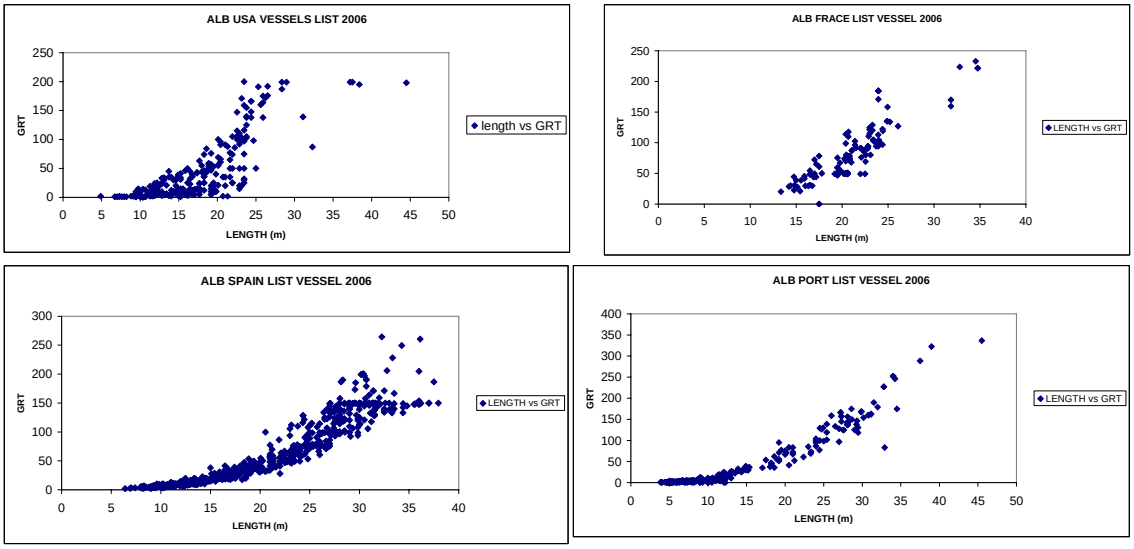


Figure 22. Characteristics of EC surface vessels (Portugal, France and Spain) and U.S. vessels in 2006.

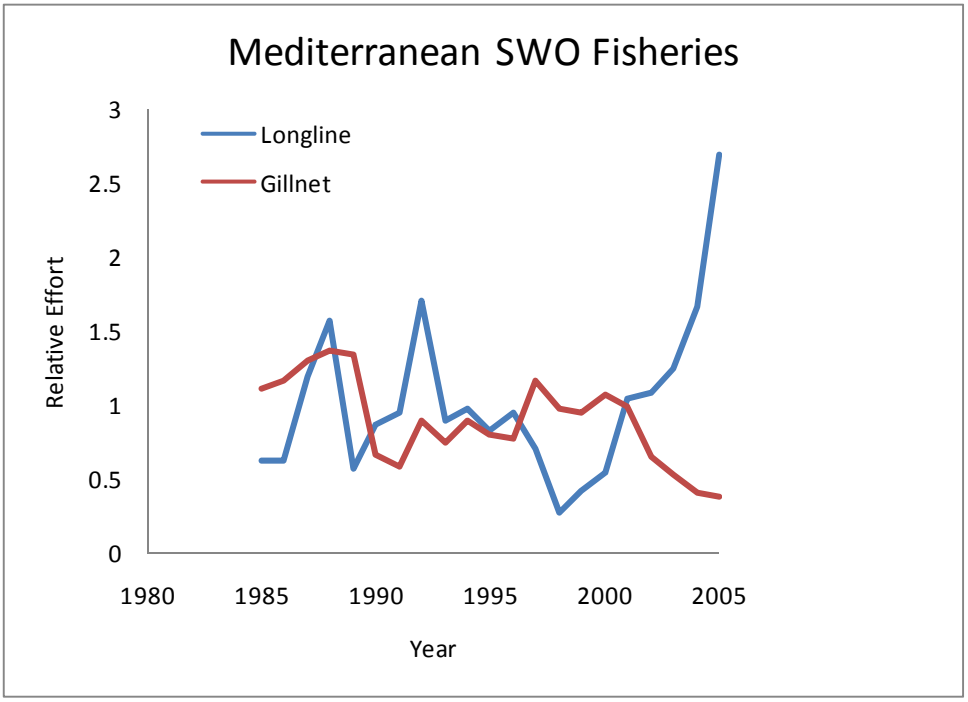


Figure 23. Patterns of relative effort levels estimated from Task II data for the Mediterranean gillnet and longline fleets harvesting swordfish.

Appendix 1

Agenda

1. Opening, adoption of the Agenda and meeting arrangements.
2. Assessment of Fishing Capacity by country/fleet/gear/fishery
    - 2.1 Aggregate estimates based on vessel numbers
        - 2.1.1 From the ICCAT record LSTFVs
        - 2.1.2 Fleet size statistics and annual reports
    - 2.2 Aggregate estimates from other sources
        - 2.2.1 Total number of LL hooks
        - 2.2.2 BB estimates from Task II
        - 2.2.3 Tropical PS from carrying capacity
    - 2.3 Species-specific information
        - 2.3.1 BFT-E from vessel lists
        - 2.3.2 ALB-N from vessel lists
        - 2.3.3 SWO-M from Task II
        - 2.3.4 Other information
3. Review of implementation of quality control procedures
    - 3.1 Assessment software catalogue
    - 3.2 Manual for CPUE standardization
    - 3.3 Technical Glossary
    - 3.4 Other
4. Other matters
5. Recommendations
6. Adoption of the report and closure

Appendix 2

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Appendix 3

Detailed Results of the General Linear Model Used to Obtain Standardized Estimates of Effort for the Baitboat Fishery in the ICCAT Region

Parameter estimates for the temperate tuna GLM in the southern hemisphere

Single factor parameter estimates and standard errors included in the temperate tuna model fitted to ICCAT CPUE series for baitboats operating in the southern hemisphere.

	Estimate	Std. Error	t value	Pr(>|t|)
(Intercept)	1.064646	1.203848	0.884	0.37966
Factor: Year				
1979	-	-	-	
1980	0.571559	0.737508	0.775	0.44107
1981	0.472368	0.68655	0.688	0.49381
1982	1.215734	0.66848	1.819	0.07343
1983	0.769778	0.679384	1.133	0.26123
1984	0.915953	0.679384	1.348	0.18213
1985	0.721952	0.820203	0.88	0.38189
1986	0.241042	0.928152	0.26	0.79589
1987	0.712854	0.820203	0.869	0.38789
1988	-0.0267	0.928152	-0.029	0.97714
1989	0.005946	0.774852	0.008	0.9939
1990	1.349906	0.820203	1.646	0.10448
1991	-0.88932	0.928152	-0.958	0.34143
1992	-0.87845	0.790188	-1.112	0.27024
1993	0.270995	0.820203	0.33	0.74213
1994	-0.53568	0.774852	-0.691	0.49175
1995	0.808353	0.750049	1.078	0.28502
1996	0.781451	0.774852	1.009	0.31684
1997	-0.06148	0.774852	-0.079	0.93699
1998	0.703648	0.831846	0.846	0.40063
1999	0.262187	0.782691	0.335	0.73869
2000	1.226452	0.946128	1.296	0.19932
2001	0.751441	0.825197	0.911	0.36576
2002	0.433648	0.879589	0.493	0.62362
2003	2.06776	0.928152	2.228	0.02925
2004	-1.39279	0.918	-1.517	0.13392
2005	0.97489	0.894979	1.089	0.27993
2006	1.174324	0.853142	1.376	0.17326
Factor: Flag				
Angola	-	-	-	-
Brazil	2.760959	0.338817	8.149	1.30e-11
Japan	-0.17666	0.402274	-0.439	0.66197
South Africa	5.139459	0.862262	5.96	1.04e-07
UK.Sta Helena	1.56551	0.47144	3.321	0.00146
Namibia	6.541896	0.636215	10.283	2.05e-15
Factor: Effort unit				
D.AT SEA	-	-	-	-
D.FISH	-1.59203	0.852662	-1.867	0.06626
LINE.DAYS	-2.04303	1.2667	-1.613	0.11147
N.POLE-D	-1.23992	1.240929	-0.999	0.3213
NO.BOATS	-0.97584	1.559101	-0.626	0.53351

NO.POLES	-2.96957	1.477219	-2.01	0.04843
SUC.D.FI	-3.11653	1.095568	-2.845	0.00589

Parameter estimates for the temperate tuna GLM in the northern hemisphere

Single factor parameter estimates and standard errors included in the temperate tuna model fitted to ICCAT CPUE series for baitboats operating in the northern hemisphere.

	Estimate	Std. Error	t value	Pr(>|t|)
(Intercept)	0.01034	1.14314	0.009	0.992786
Factor: Year				
1952	-	-	-	-
1953	-0.06939	1.49971	-0.046	0.963125
1954	0.36817	1.49971	0.245	0.806227
1955	0.49545	1.49971	0.33	0.741333
1956	-0.16965	1.49971	-0.113	0.910003
1957	-0.11089	1.30521	-0.085	0.932345
1958	-0.50649	1.49971	-0.338	0.735785
1959	-0.39012	1.30521	-0.299	0.765205
1960	-1.13177	1.49971	-0.755	0.450987
1961	-1.12296	1.30521	-0.86	0.390205
1962	-0.72308	1.49971	-0.482	0.630021
1963	-2.72619	1.30819	-2.084	0.03793
1964	-2.8299	1.30819	-2.163	0.031237
1965	-2.04169	1.23612	-1.652	0.099544
1966	-0.35675	1.23612	-0.289	0.773064
1967	-1.72245	1.23612	-1.393	0.164423
1968	-2.04635	1.23612	-1.655	0.098777
1969	-0.06239	1.20081	-0.052	0.958594
1970	-0.10156	1.20081	-0.085	0.932649
1971	0.0114	1.20081	0.009	0.992431
1972	0.5022	1.16445	0.431	0.666546
1973	0.22409	1.15362	0.194	0.846097
1974	0.24153	1.13369	0.213	0.831418
1975	-0.70977	1.12202	-0.633	0.527442
1976	-0.13901	1.12561	-0.123	0.901787
1977	-0.84727	1.11761	-0.758	0.448925
1978	-0.3451	1.12262	-0.307	0.758729
1979	-0.11467	1.15532	-0.099	0.920995
1980	0.24898	1.16519	0.214	0.83093
1981	-0.28709	1.1387	-0.252	0.8011
1982	-0.04769	1.13145	-0.042	0.966403
1983	1.13574	1.14006	0.996	0.319874
1984	0.61576	1.15598	0.533	0.594616
1985	0.93512	1.16678	0.801	0.423443
1986	0.35156	1.17832	0.298	0.765619
1987	0.5583	1.18352	0.472	0.637431
1988	0.26575	1.167	0.228	0.820002
1989	0.28598	1.15716	0.247	0.804954
1990	0.30967	1.15652	0.268	0.789052
1991	0.19275	1.13543	0.17	0.865303
1992	0.13838	1.13914	0.121	0.903386
1993	0.46283	1.13825	0.407	0.684553
1994	0.32614	1.14825	0.284	0.776561
1995	0.38969	1.14526	0.34	0.733871

1996	0.33594	1.14825	0.293	0.770035
1997	0.43898	1.14432	0.384	0.701507
1998	0.28739	1.14331	0.251	0.801687
1999	0.70022	1.13662	0.616	0.538282
2000	0.80672	1.13928	0.708	0.479382
2001	0.49315	1.14354	0.431	0.666567
2002	0.34552	1.13601	0.304	0.761203
2003	0.72677	1.14815	0.633	0.527175
2004	0.41842	1.14936	0.364	0.716052
2005	0.33453	1.14432	0.292	0.77021
2006	0.50853	1.15315	0.441	0.659504
Factor: Flag				
Cape Verde	-	-	-	-
EC.España	6.41598	0.3646	17.597	2.00E-16
EC.France	6.19033	0.42685	14.502	2.00E-16
EC.Portugal	4.44038	0.44152	10.057	2.00E-16
ET	0.01773	0.39783	0.045	0.964487
Gabon	-0.25932	1.19018	-0.218	0.827655
Ghana	-0.07935	0.40362	-0.197	0.844272
Korea, Republic of	0.37064	0.42868	0.865	0.387879
Panama	0.36095	0.49378	0.731	0.465302
Venezuela	0.88049	0.41497	2.122	0.034596
Factor: Effort unit				
D.AT SEA	-	-	-	-
D.FISH	-0.0746	0.18368	-0.406	0.684879
FISH.HOUR	-0.44374	0.34475	-1.287	0.198939
HOURS.SEA	-0.45767	0.35156	-1.302	0.193878
N.POLE-D	-1.96036	0.3001	-6.532	2.43E-10
NO.LINES	1.32612	0.69872	1.898	0.058574 .
NO.SETS	NA	NA	NA	NA
NO.TRIPS	-1.7208	0.51183	-3.362	0.000864
SUC.D.FI	-0.39247	0.4271	-0.919	0.358797

Parameter estimates for the tropical tuna GLM

Single factor parameter estimates and standard errors included in the tropical tuna model fitted to ICCAT CPUE series for baitboats.

	Estimate	Std. Error	t value	Pr(>|t|)
(Intercept)	6.848516	0.97468	7.026	8.02e-12
Factor: Year				
1963	-	-	-	-
1964	-0.27199	1.132785	-0.24	0.81036
1965	0.009347	1.070982	0.009	0.993041
1966	-0.11505	1.070982	-0.107	0.914497
1967	0.074404	1.070982	0.069	0.944645
1968	0.070362	1.070982	0.066	0.947648
1969	0.098299	1.019313	0.096	0.923217
1970	0.080528	1.019313	0.079	0.937066
1971	0.164038	1.019313	0.161	0.872222
1972	0.239966	0.998537	0.24	0.810195
1973	0.058658	0.983344	0.06	0.95246
1974	0.258446	0.971852	0.266	0.790415
1975	-0.0479	0.968082	-0.049	0.960557
1976	-0.13074	0.968597	-0.135	0.892688

1977	-0.2374	0.96314	-0.246	0.805421
1978	0.221731	0.963914	0.23	0.818173
1979	0.426004	0.975286	0.437	0.662469
1980	-0.00064	0.97807	-0.001	0.999475
1981	-0.5342	0.964962	-0.554	0.58013
1982	-0.11622	0.960994	-0.121	0.903798
1983	-0.10382	0.965374	-0.108	0.914404
1984	0.162721	0.970327	0.168	0.866898
1985	0.108818	0.982947	0.111	0.911899
1986	0.102104	0.99278	0.103	0.918131
1987	-0.42871	0.992811	-0.432	0.666088
1988	0.420786	0.991916	0.424	0.671614
1989	-0.03082	0.98024	-0.031	0.974933
1990	0.562685	0.983183	0.572	0.567402
1991	-0.00646	0.974676	-0.007	0.994716
1992	-0.07156	0.97368	-0.073	0.94145
1993	-0.13206	0.974681	-0.135	0.892283
1994	-0.12227	0.977	-0.125	0.900466
1995	-0.1816	0.97434	-0.186	0.852233
1996	-0.0564	0.976626	-0.058	0.953972
1997	-0.31562	0.974948	-0.324	0.746292
1998	-0.14436	0.977324	-0.148	0.882638
1999	-0.26665	0.971572	-0.274	0.783862
2000	-0.62414	0.977371	-0.639	0.52342
2001	-0.27747	0.976096	-0.284	0.776341
2002	-0.2759	0.97139	-0.284	0.776526
2003	-0.17774	0.982644	-0.181	0.856541
2004	-0.37179	0.977595	-0.38	0.703895
2005	-0.12589	0.977286	-0.129	0.89756
2006	-0.37219	0.983155	-0.379	0.705187
Factor: Flag				
Angola	-	-	-	-
Brasil	1.533667	0.284289	5.395	1.12e-07
Cape Verde	-0.09548	0.372517	-0.256	0.797826
EC.España	-7.02501	0.250362	-28.059	2e-16
EC.France	-6.78614	0.328833	-20.637	2e-16
EC.Portugal	0.259027	0.304592	0.85	0.395557
ET	-0.33104	0.275008	-1.204	0.229332
Gabon	1.458847	0.991977	1.471	0.142095
Ghana prior to 1991	0.964665	0.299862	3.217	0.001390
Japan	1.466024	0.283627	5.169	3.57e-07
Korea, Republic of	1.246629	0.313384	3.978	8.12e-05
Panama	1.658593	0.38107	4.352	1.67e-05
South Africa	-2.59133	0.301833	-8.585	2e-16
UK.Sta Helena	-3.16388	0.400489	-7.9	2.21e-14
Venezuela	0.05636	0.284568	0.198	0.843094
Namibia	-3.44268	0.447324	-7.696	9.17e-14
Ghana 1991 - 1995	1.916085	0.516786	3.708	0.000236
Ghana 1996 - 2006	2.095293	0.410488	5.104	4.93e-07
Factor: Effort unit				
D.AT SEA				
D.FISH	0.601439	0.13667	4.401	1.35e-05
FISH.HOUR	-0.09675	0.244698	-0.395	0.692758
HOURS.SEA	-1.14184	0.250751	-4.554	6.82e-06

LINE.DAYS	1.17865	0.762067	1.547	0.12266
N.POLE-D	-0.37836	0.242453	-1.561	0.119347
NO.BOATS	-0.04145	0.715449	-0.058	0.953829
NO.LINES	-3.88813	0.595179	-6.533	1.77e-10
NO.POLES	0.236489	1.018695	0.232	0.81653
NO.SETS	NA	NA	NA	NA
NO.TRIPS	-0.18774	0.426256	-0.44	0.659841
SUC.D.FI	-0.00802	0.353808	-0.023	0.981925

Appendix 4

Tentative list of terms to be included or redefined in the update ICCAT Glossary

New Terms

Acoustic tag
Aerial survey *
Age class
Age validation
Area closure
A-SCALA
Attrition rate
Baseline prior
Batch fecundity
Bayesian Surplus model
Best scientific evidence
Bio-economic modelling
Biological diversity
Biological indicator
Capacity
Capacity Utilization
CASAL
Collapse
Current Annual Yield
Data envelopment analysis (DEA)
Data mining
Decision rule
Delay-difference model
Density dependence
Depensation
Discrete time step models
Ecological impact
Ecosystem approach
Electronic tag
Endangered
Environmental impact
Environmental indicator
ERAEF
Escapement
Farming
Fatting
Finning
Fishery indicator
Generalized biomass dynamic model
Genetic diversity
Global warming

* The updated glossary could be re-organized grouping similar terms under general definitions. For example: "surveys". This proposal should include an alphabetic index of terms in order to facilitate the search.

GLOSS
Habitat-based Models
Homing
Interaction
Juvenile
Lumped biomass dynamics model
Maximum Constant Yield
MBAL
Mitochondrial DNA
Opportunistic
Over-capacity
Overlap model
Prior distribution
Reference point
Relative abundance-F
Scaling factor
Size limit
Sport fisheries
SS2 model
Step-wise regression
Tail tag
Target species
Targetting
Unit stock
Vulnerability
Zero-inflated Models

Terms to be redefined according with the Assessment Methods Group definitions

Harvesting Capacity (Capacity Output) (Fishing Capacity)
Carrying Capacity
Excess Capacity
Fishing Power