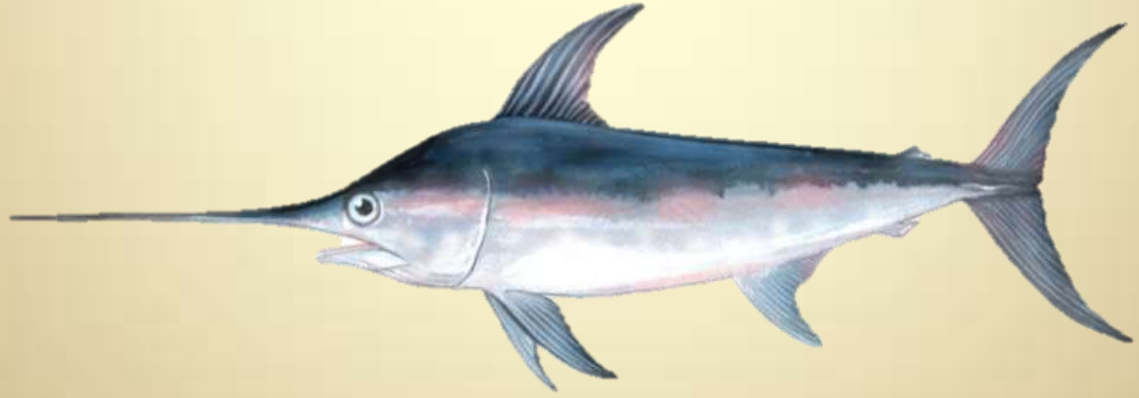
Panel 4: Other species

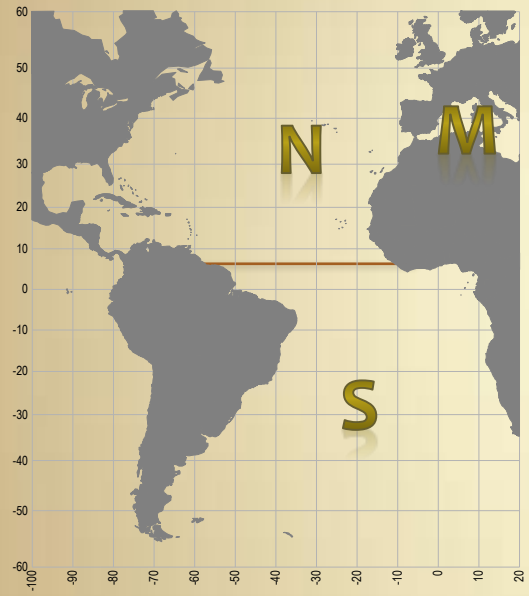
SWO Swordfish
BUM WHM Marlins
SAI Sailfish
SMT Small tunas
SHK Sharks
Seabirds
Turtles

Panel 4: Items to be discussed

- **Swordfish**
  - North Atlantic (assessed in 2009)
  - South Atlantic (assessed in 2009)
  - Mediterranean (assessed in 2010)
- **Marlins**
  - **BUM - Blue marlin (assessed in 2011)**
  - WHM – White marlin (assessed in 2006)
- **Sailfish** (assessed in 2009)
- **Sharks**
- **Seabirds**
- Responses to Commission's requests
- General recommendations to the Commission

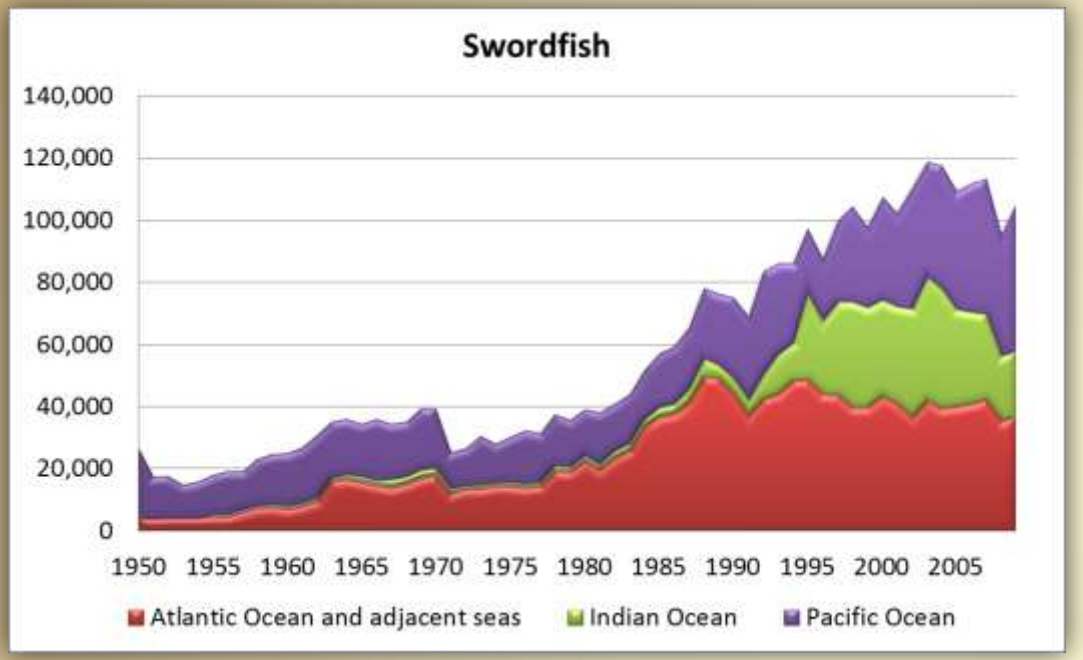
Swordfish

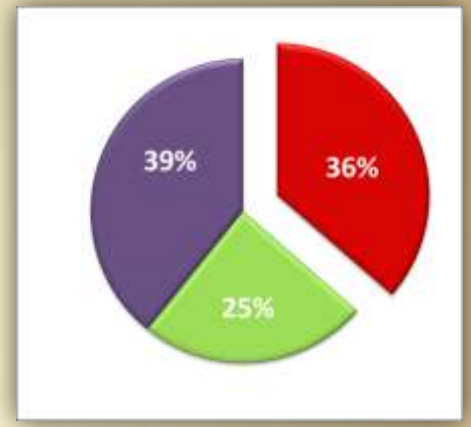




3 management units

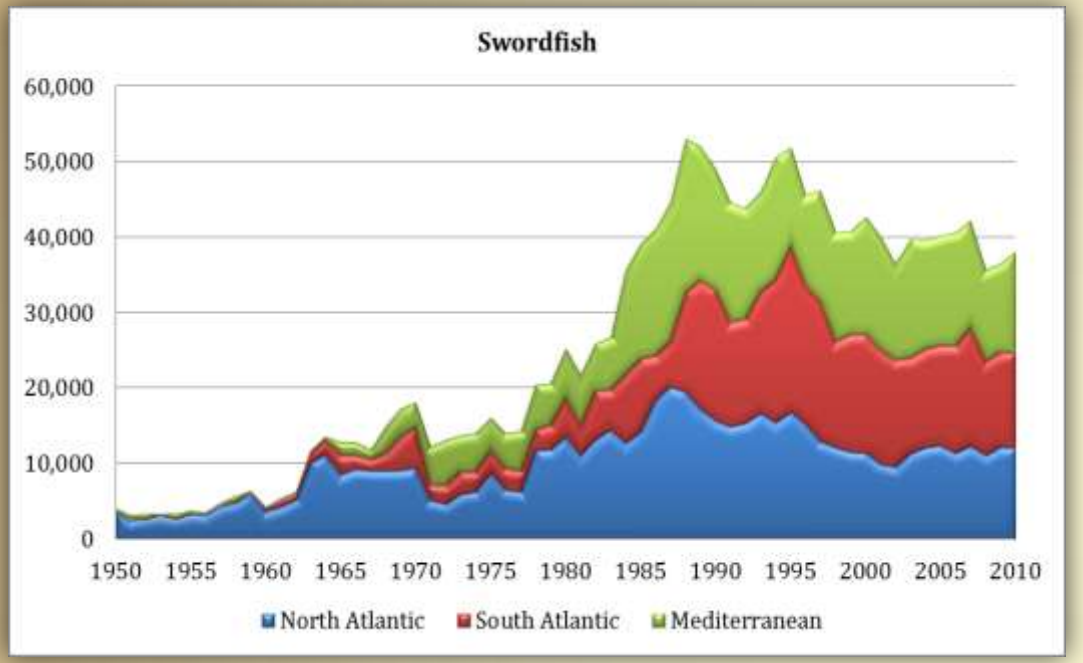
Albacore, Atún blanco, Germon	
Scientific name	*Xiphias gladius*
Distribution	Cosmopolitan species found in the tropical and temperate waters of all the oceans, between 45°N and 45°S,including the Mediterranean.
Spawning grounds	In subtropical western areas of both hemispheres and throughout the Mediterranean Sea
Maturity	Atlantic: 156 cm (age 5) / Mediterranean: 140 cm (age 3.5)
Life span	Atlantic: 15 years / Mediterranean: 10 years
Maximum size	Atlantic: 455 cm (537 kg) / Mediterranean: xx cm (230 kg)
Natural mortality	Assumed M=0.2

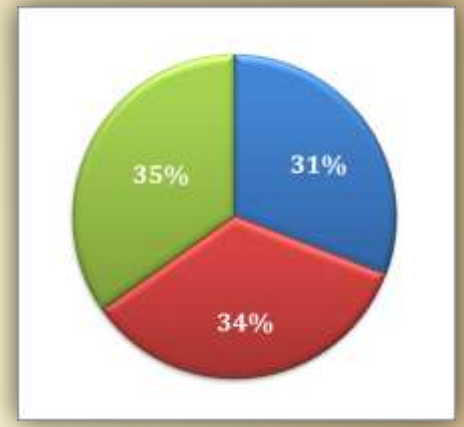




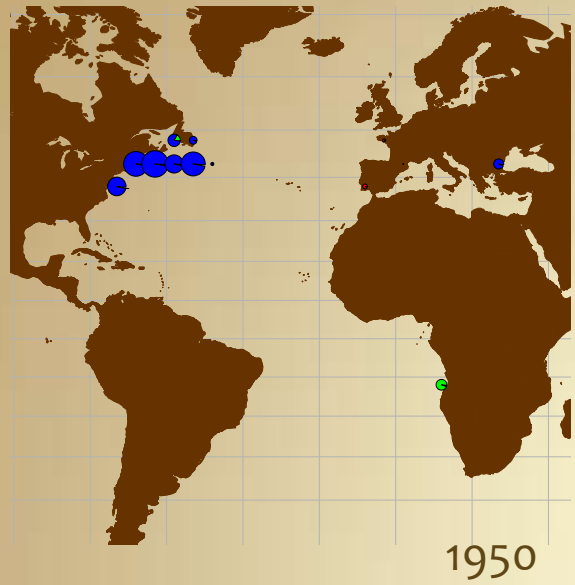
% average catch in 2005-2010

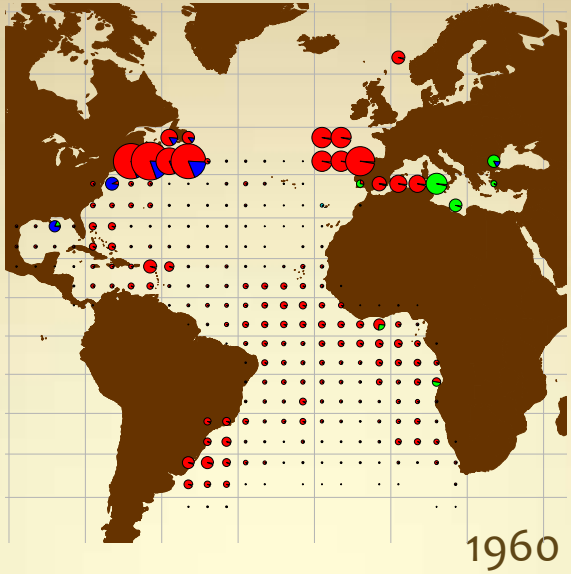
- **Atlantic** and Mediterranean SWO represents **36% of the world production** (average 2005-2010).

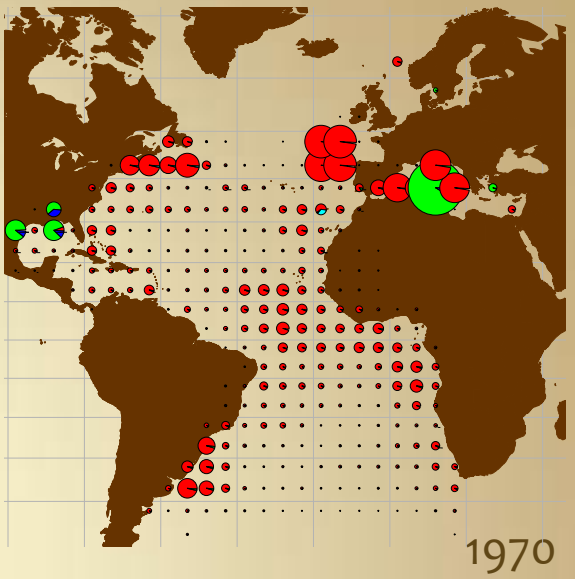


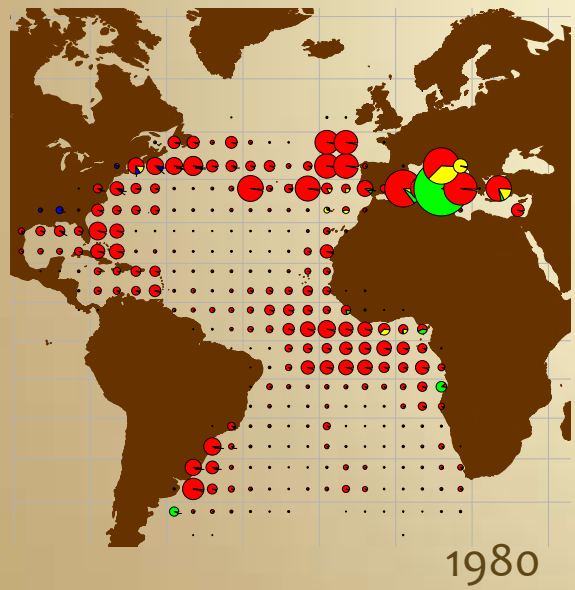


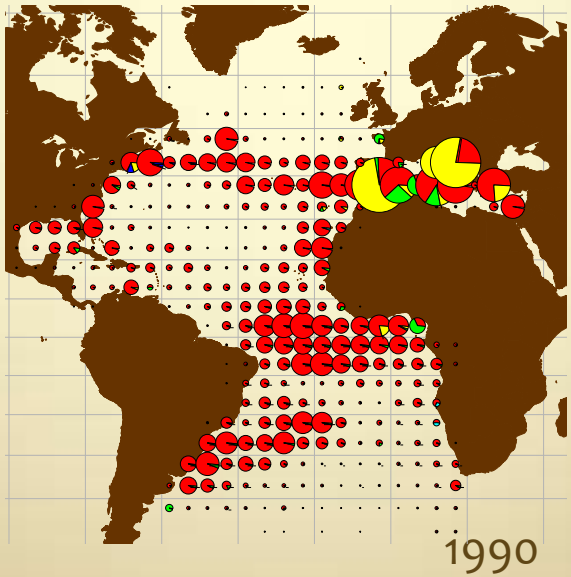
% average catch in 2005-2010

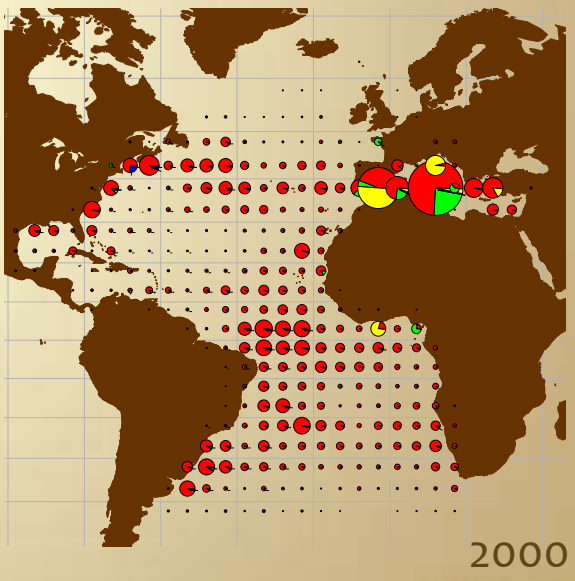








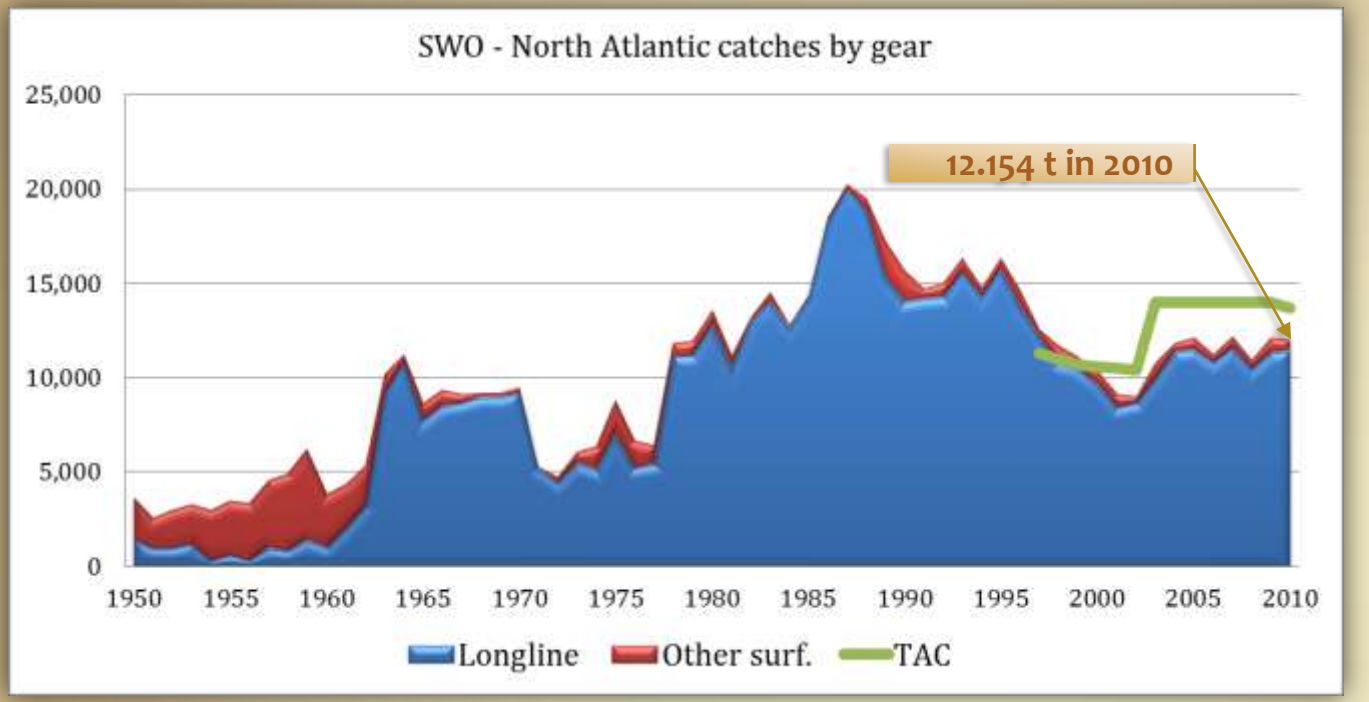


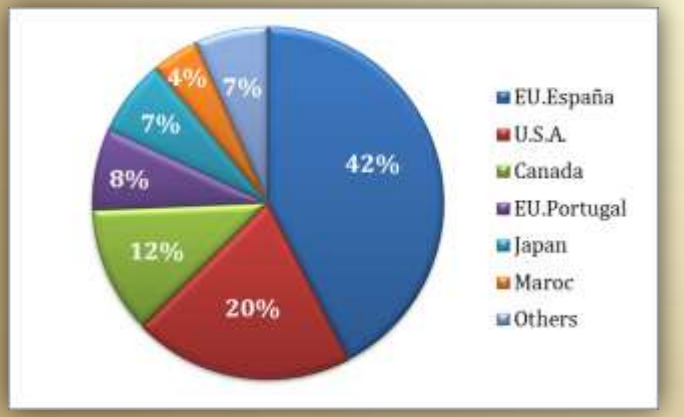


LL others HP BB PS GN

North Atlantic swordfish

Last assessment: 2009

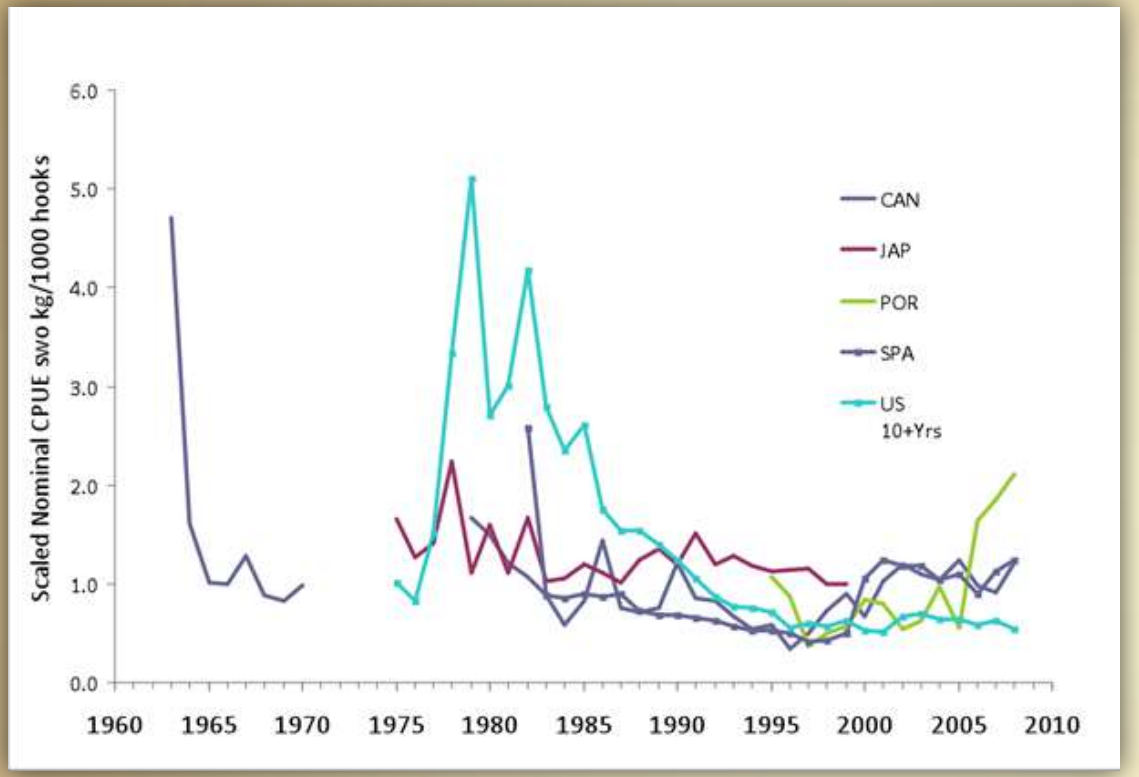




% average catch in 2005-2010

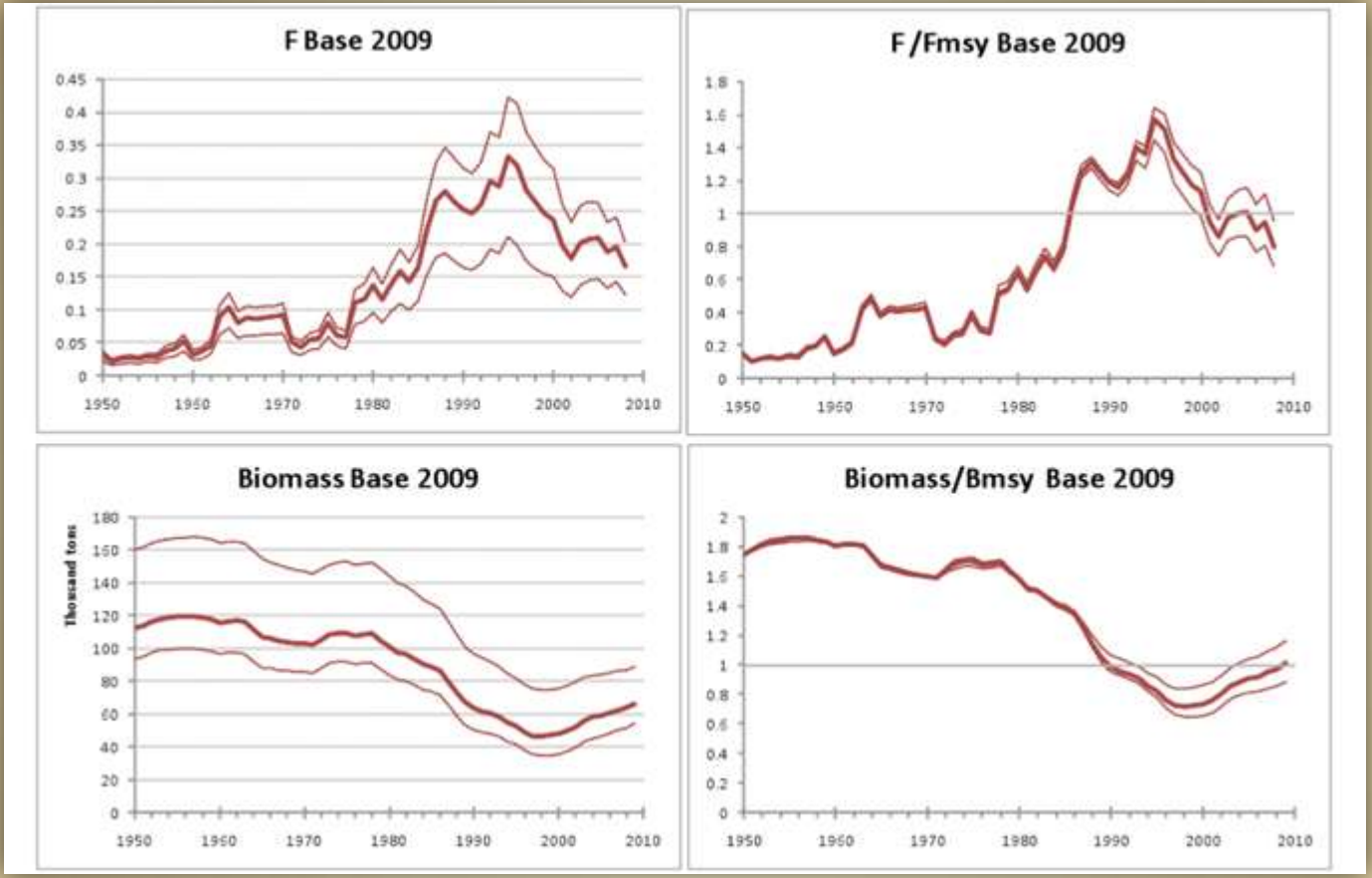
Recent catches have been less than the TAC

CPUE trends



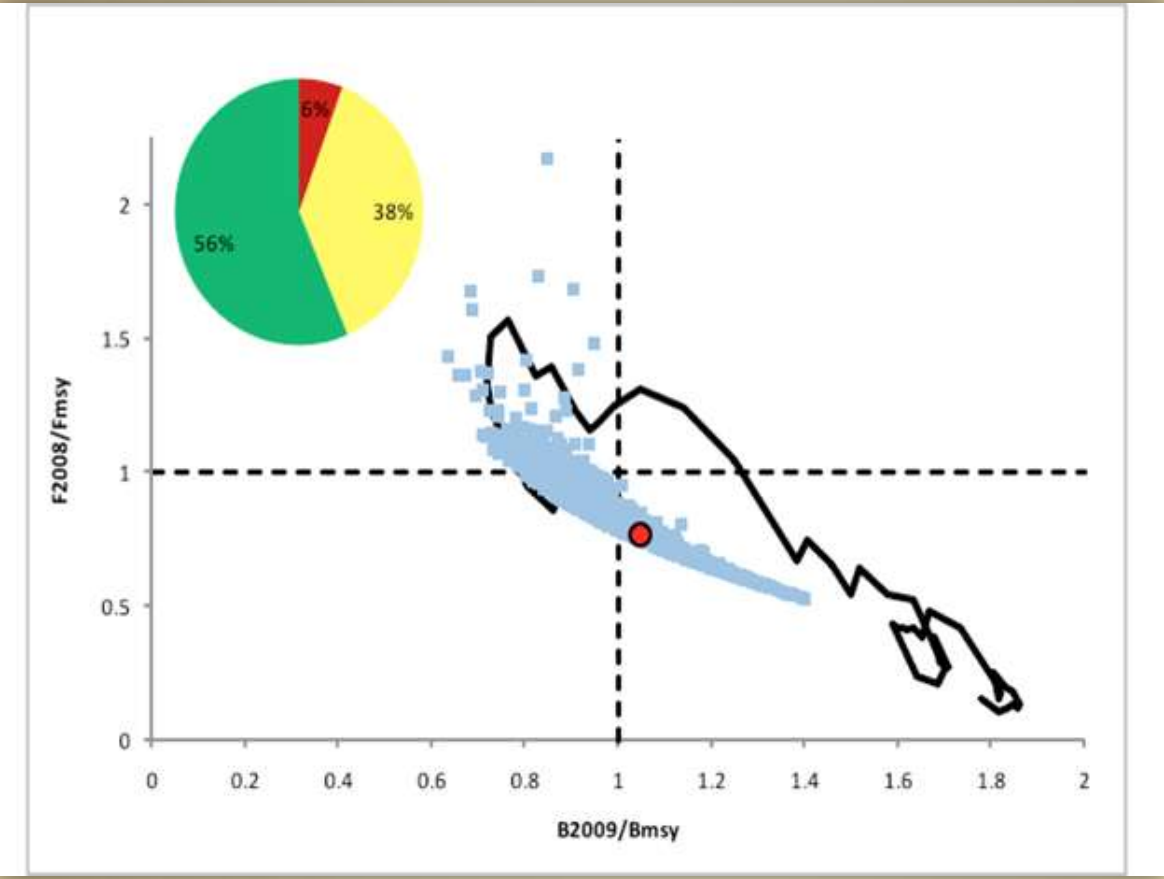
- Five nations contribute catch rates that are used in the production model.
- Most of the series have an increasing trend since the late 1990s, but the USA catch rates remained relatively flat.

Stock status (SWO North Atlantic): ASPIC Production Model results



- The current results indicate that the stock is **at or above B_{MSY}.**
- Fishing mortality has been **below F_{MSY} since 2005.**
- These results generally supported by Bayesian Surplus Production and VPA.

Stock status (SWO North Atlantic): ASPIC Production Model results

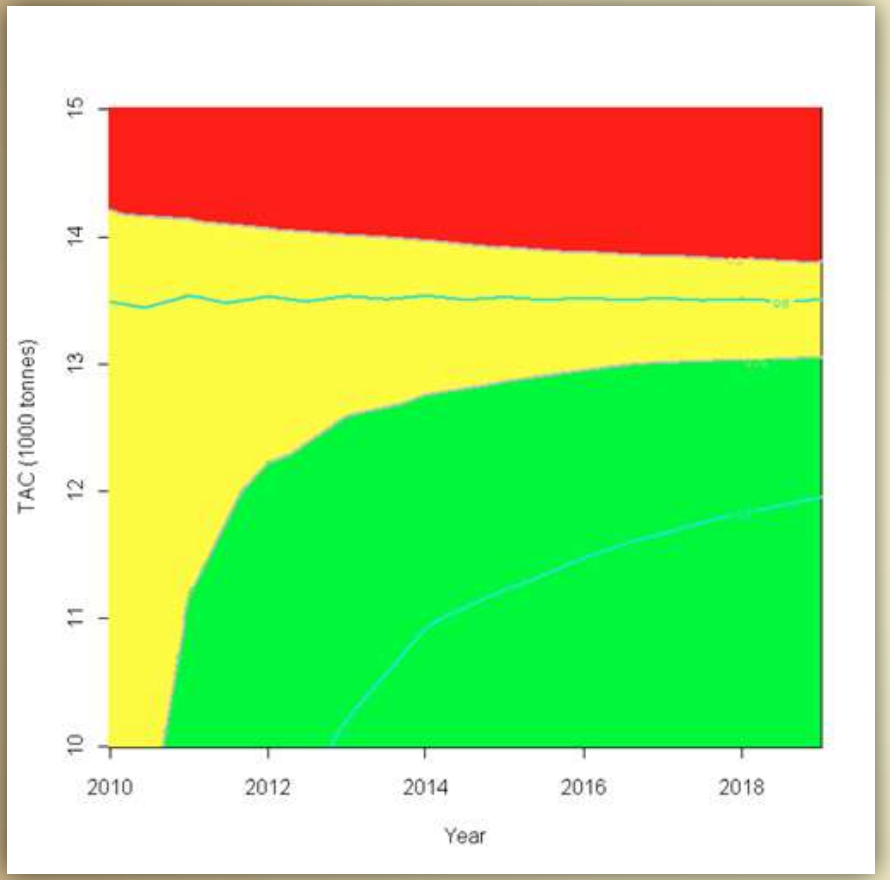


- The results suggest that there is **greater than 50% probability that the stock is at or above B_{MSY},** and thus the **Commission's rebuilding objective [99-2] has been achieved.**

Stock status (SWO North Atlantic): A cautionary note

- The Committee noted that **allowable catch levels** agreed in [Rec. 06-02 and Rec. 08-02] **exceeded scientific recommendations.**
- The successful rebuilding of this stock could have been compromised if recent catches had been higher than realized.
- Rec 09-02 attempts a partial **remedy**: "If the total catch in 2010 exceeds 13,700 t, the excess amount shall be deducted from the quota/catch limit for each CPC on a prorata basis in 2011."

Outlook: K2SM

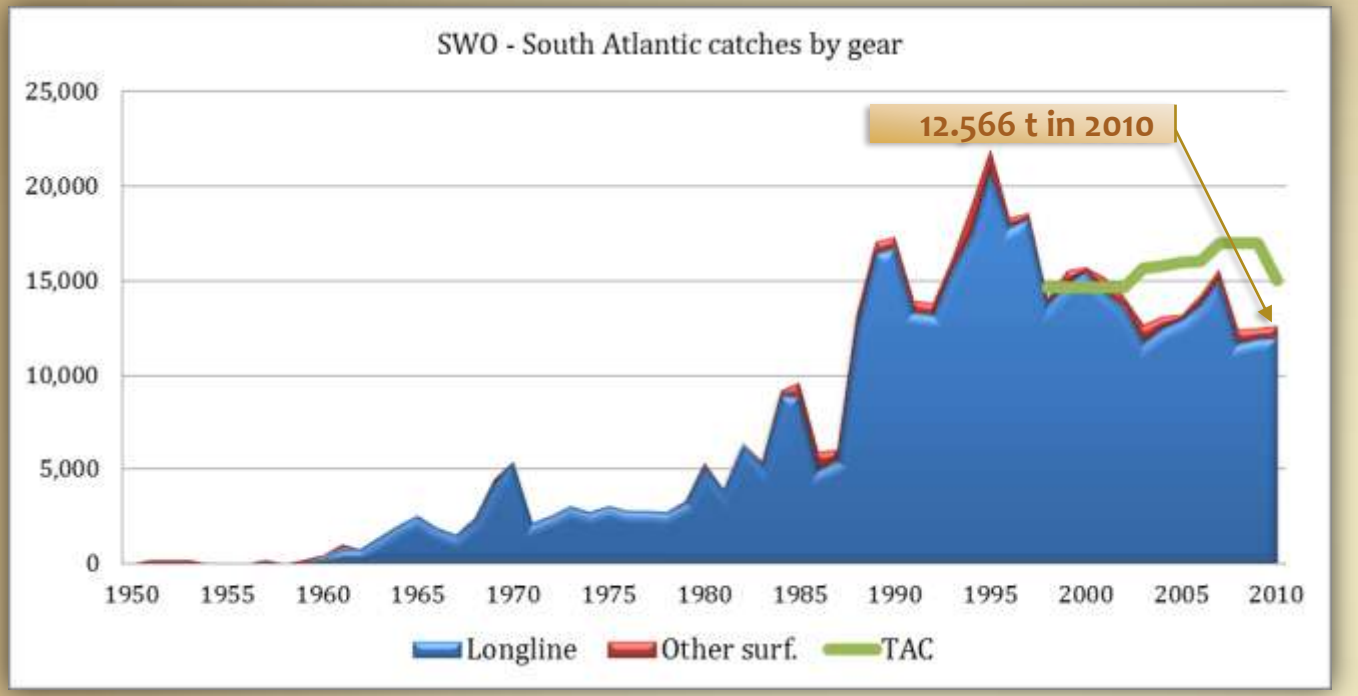


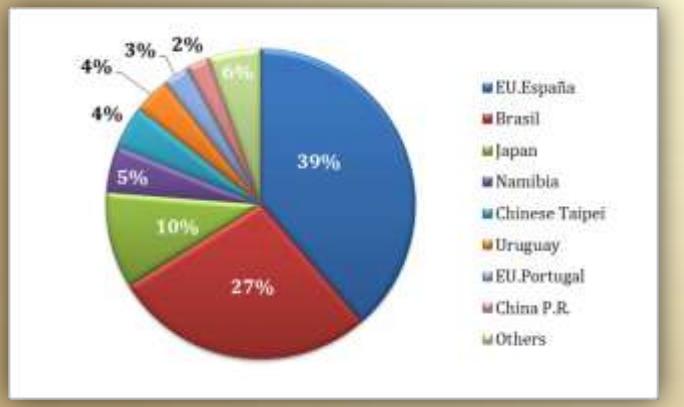
Probability contours of $B>B_{MSY}$ & $F<F_{MSY}$ for constant catch scenarios indicated over time. Red: P<50% , Yellow 50<P<75%, Green P>75%.

A total annual catch of **13,000 t** would provide **~75% probability** of maintaining the stock at a level consistent with the Convention Objective over the next decade.

South Atlantic swordfish

Last assessment: 2009

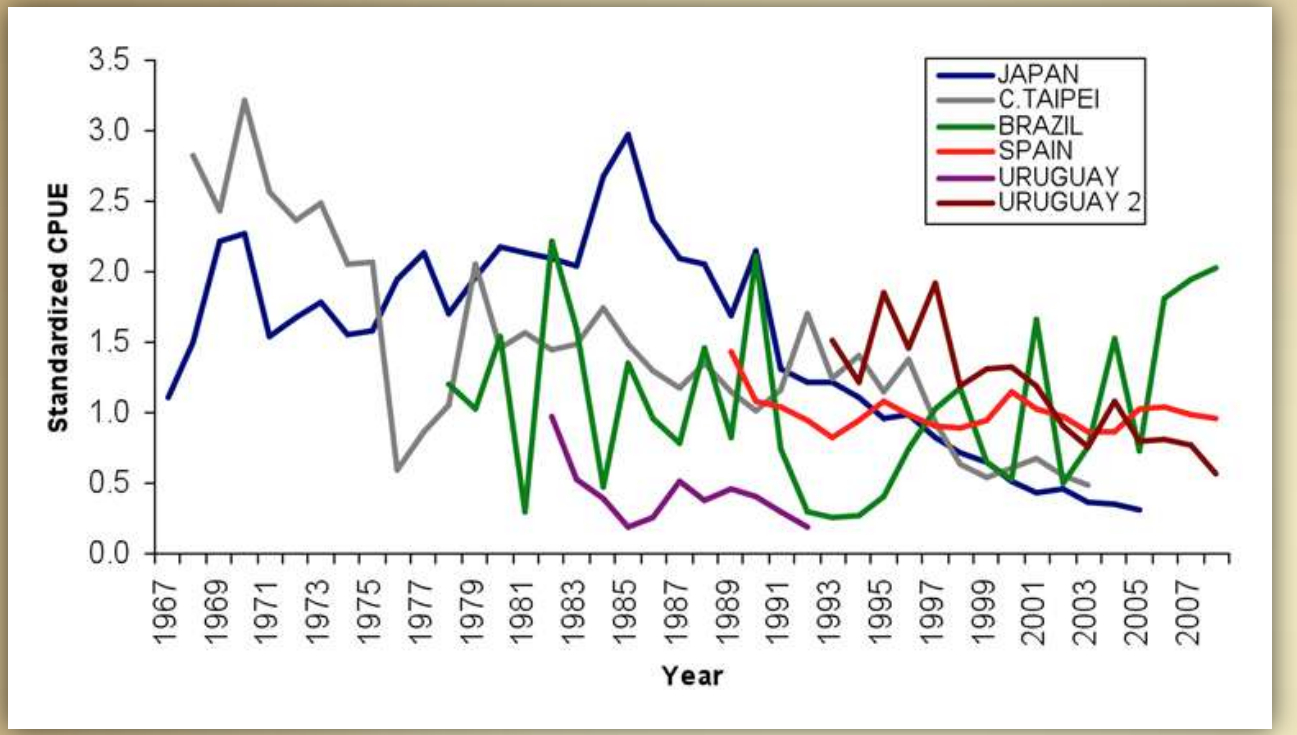




% average catch in 2005-2010

Recent catches have been less than the TAC

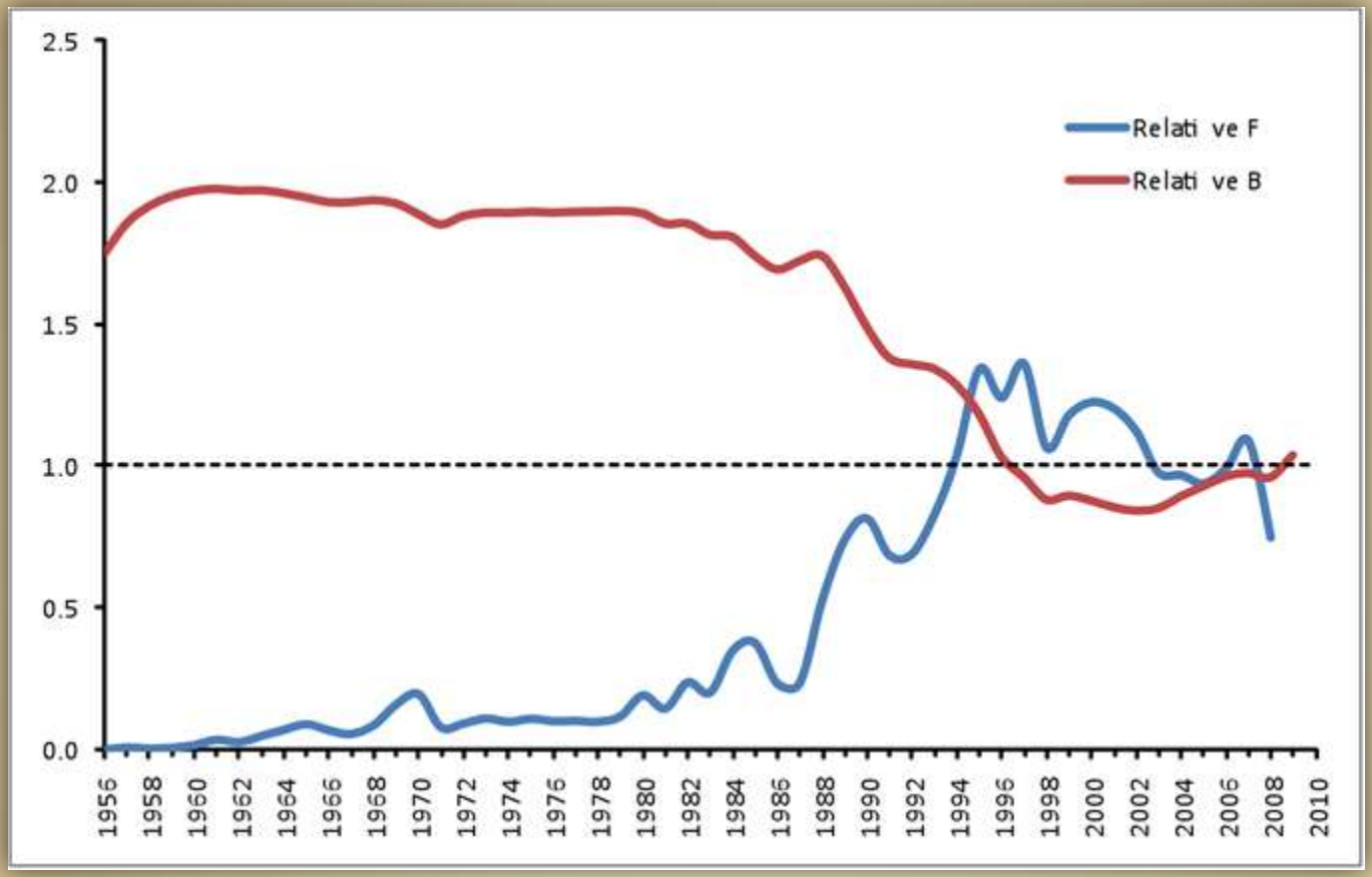
CPUE trends



- As observed in the 2006 assessment, the CPUE trend from **targeted and non-targeted fisheries show different trends and high variability** which indicates that at least some are not depicting trends in the abundances of the stock.

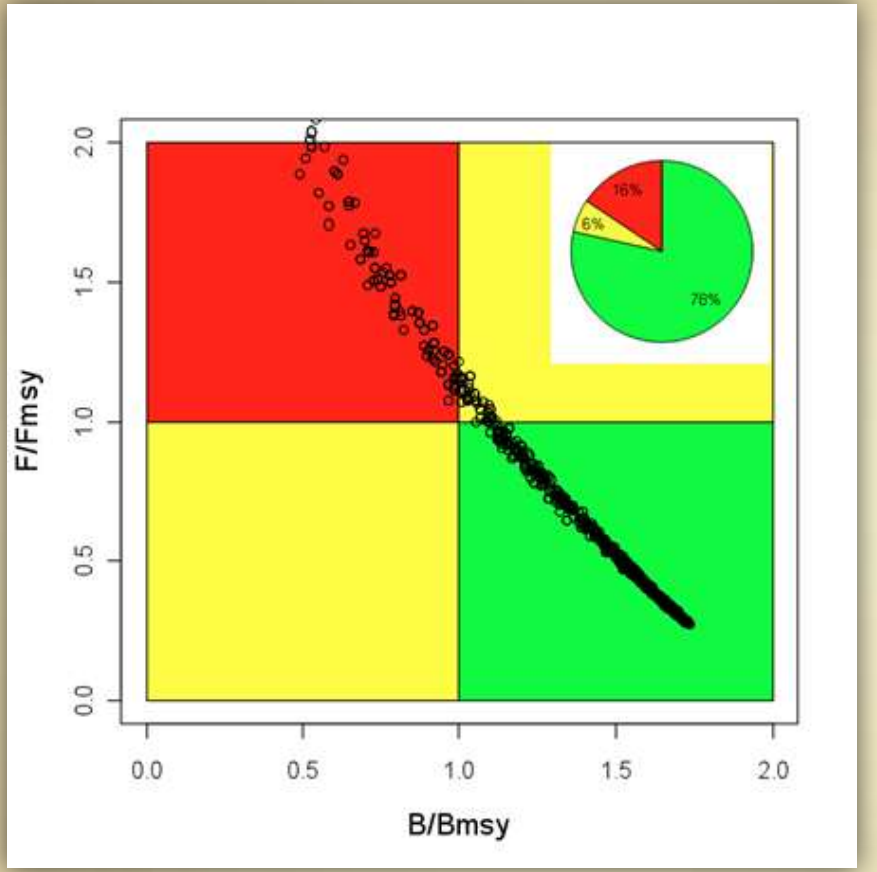
- It was noted that there was little overlap in fishing area and strategies between the by-catch and targeted fleets used for estimating CPUE pattern, and therefore the by-catch and targeted fisheries CPUE trends **could be tracking different components** of the population.

Stock status (SWO South Atlantic): ASPIC Production Model results



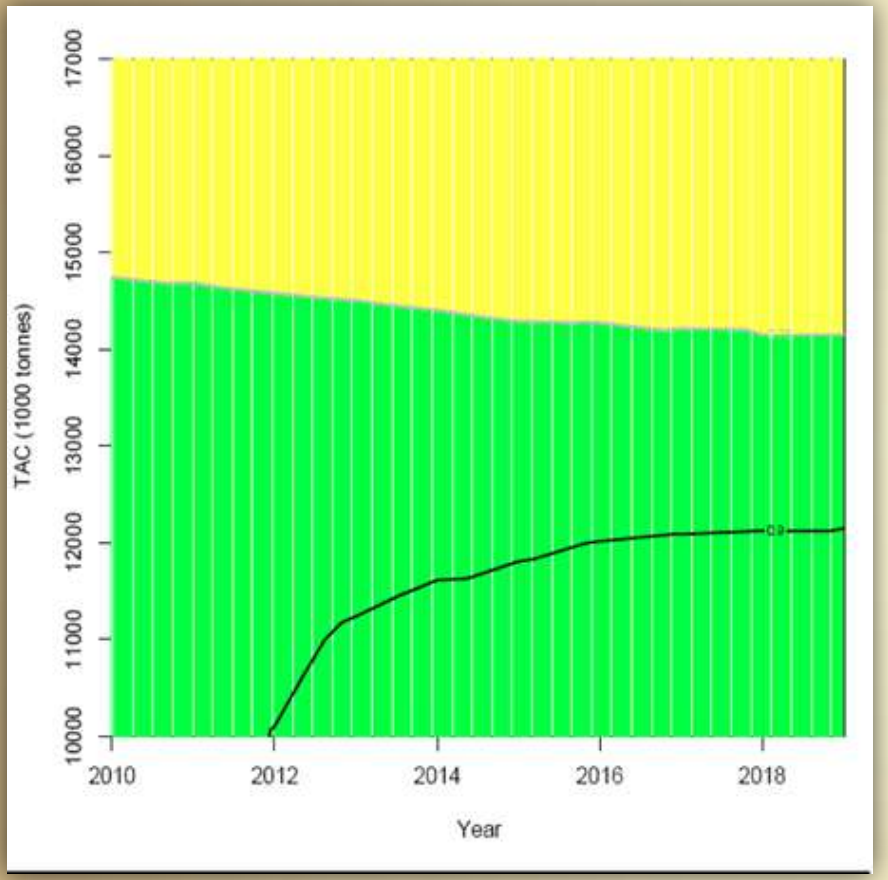
- Current estimated relative fishing mortality (F_{2008}/F_{MSY}) was 0.75 indicating that **the stock is not overexploited**. Current estimated relative biomass (B_{2009}/B_{MSY}) was 1.04.

Stock status (SWO North Atlantic): ASPIC Production Model results



- Conditioned only on the catches, the model estimated a probability **of 78% that the stock is not overfished and it is not ongoing overfishing,** and thus the stock is in the zone consistent with the Commission's objective.

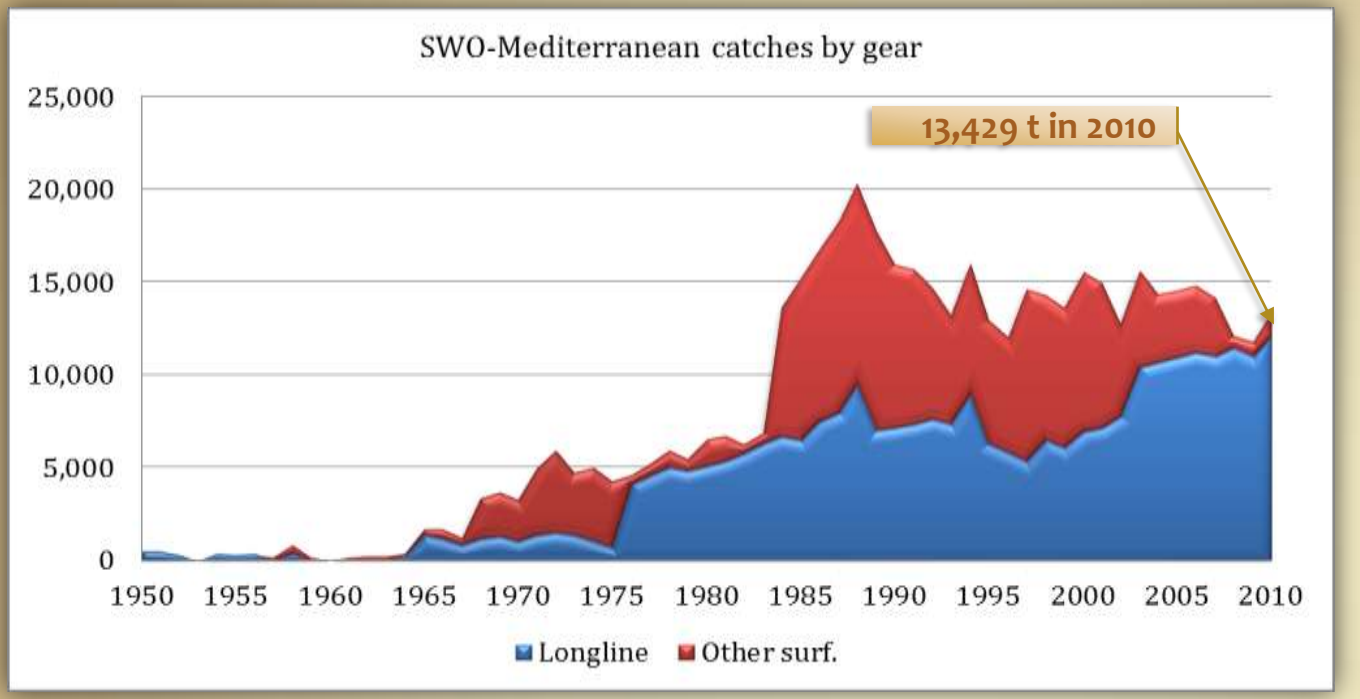
Outlook: K2SM

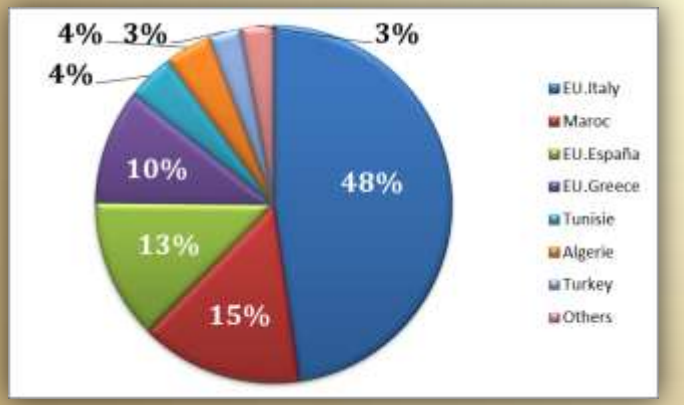


- The analysis indicated that catches on the order of **17,000t** will result in a probability of 67% of being above B_{MSY} in 10 years.
- Considering unquantified uncertainties and conflicting indications for the stock, the Committee recommends a **more precautionary approach**, limiting catches to the recent average level **(~15,000 t)**, which are expected to maintain the catch rates at about their current level.

Mediterranean swordfish

Last assessment: 2010

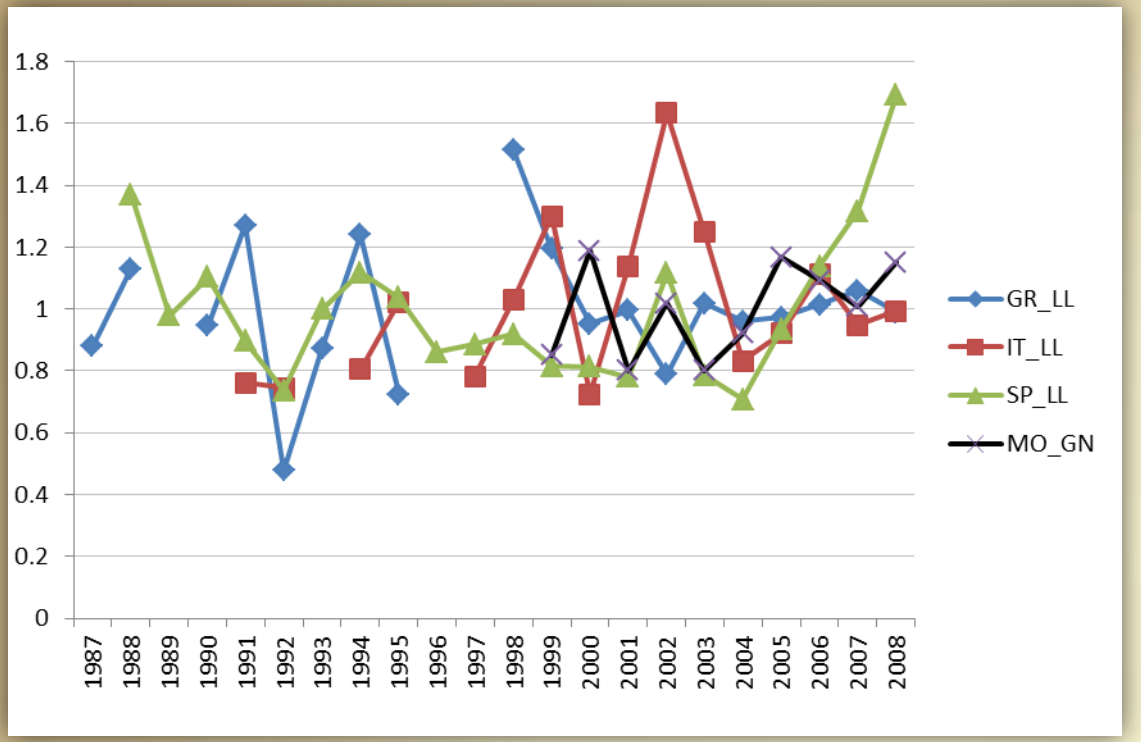




% average catch in 2005-2010

- Main gears: Longlines & Gillnets
- Catches around 12000-16000 t in the last 15 years

CPUE trends

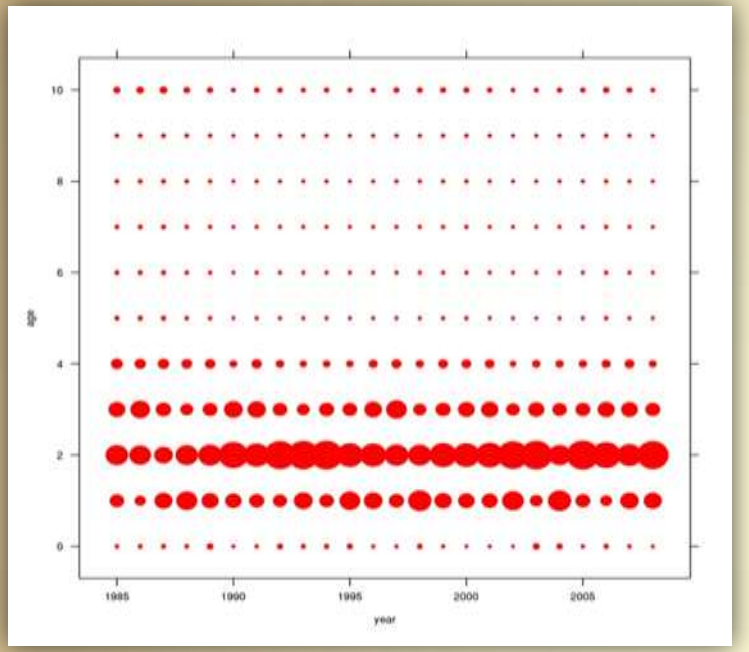


- Standardised CPUE series from the main LL and GN fisheries targeting SWO, which were presented during the 2010 stock assessment session, **did not reveal any trend over time.**

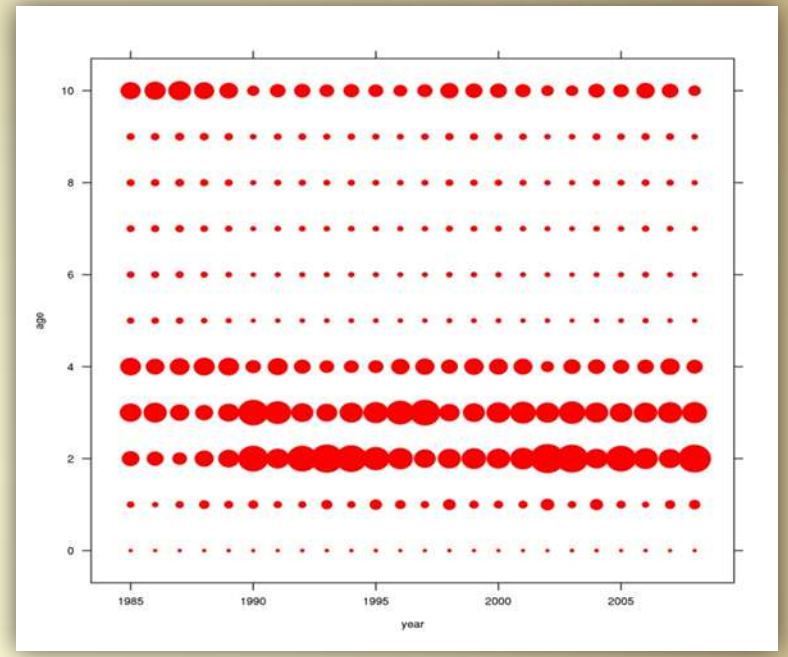
- CPUE series, however, **covered only the last 10-20 years** and not the full time period of reported landings.

Proportion of catch numbers (left) and catch weight (right) at age by year

Number

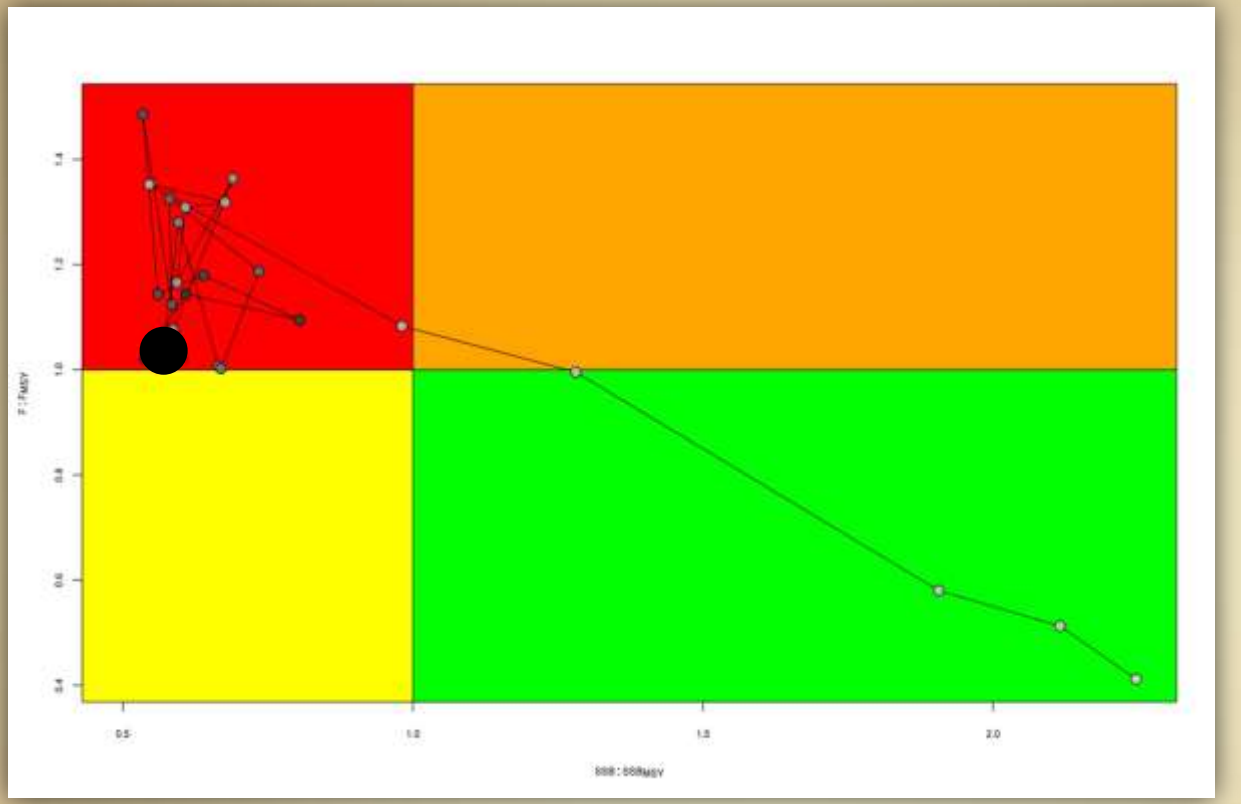


Weight



- The Committee again noted the large catches of small size swordfish, i.e., less than 3 years old (many of which have probably never spawned) and the relatively low number of large individuals in the catches.
- Fish less than three years old usually represent 50-70% of the total yearly catches in terms of numbers and 20-35% in terms of weight.
- A reduction of the volume of juvenile catches would improve yield per recruit and spawning biomass per recruit levels.

Stock status (Mediterranean): XSA



- The stock is below the level which can support MSY
- Current (2008) fishing mortality slightly exceeds F_{MSY}
- Age structured analysis indicates that current (2008) biomass levels are ~50% below B_{MSY}
- Biomass and recruitment levels stable over the last 15 years

Stock status (Mediterranean): Summary Table

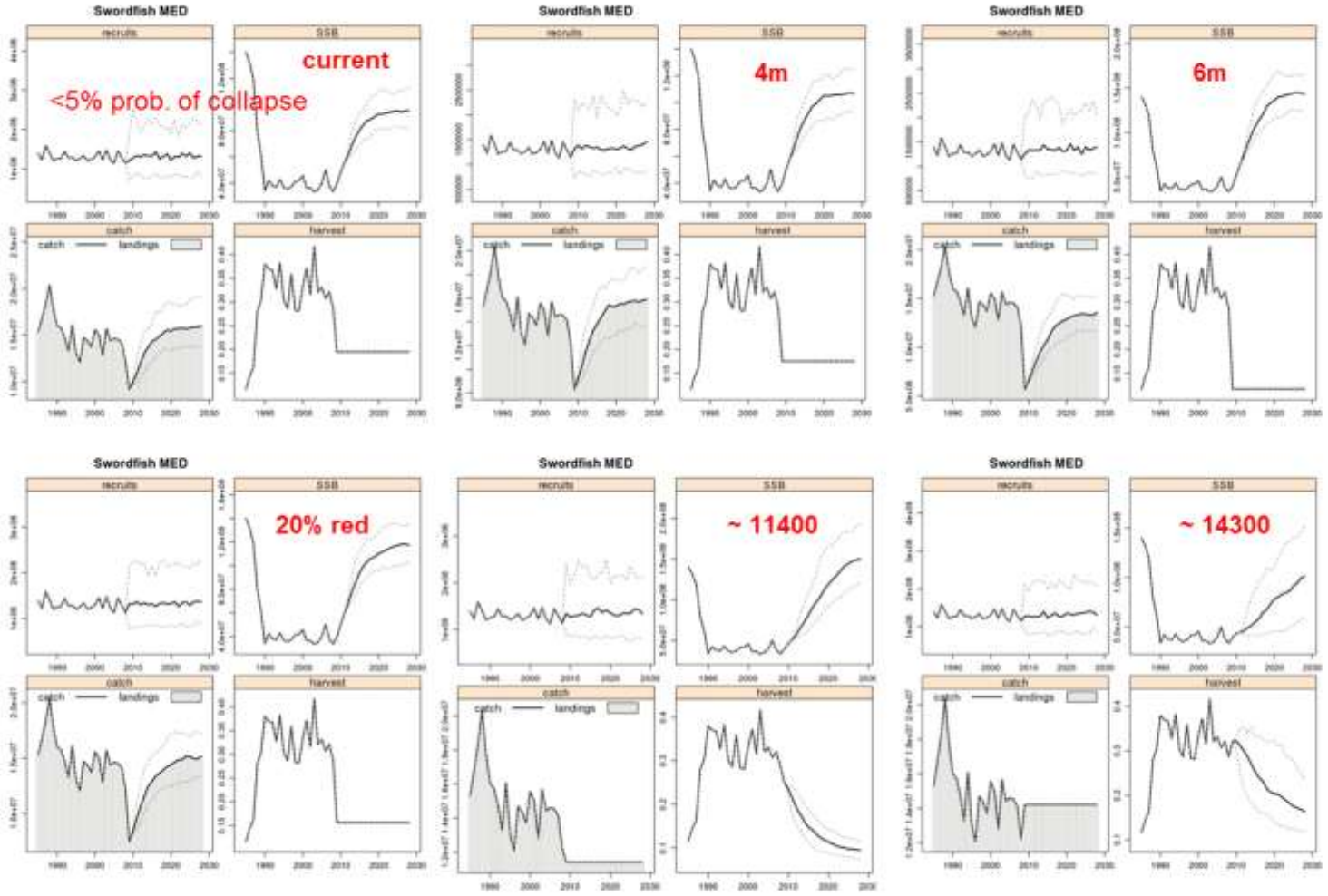
Maximum Sustainable Yield	14,600-16,700
Current (2008) Yield	11,153 t
Current (2008) Replacement Yield	~12,100 t
(B_{2008}/B_{MSY})	0.54-0.96
F_{2008}/F_{MSY} F_{2008}/F_{MAX} $F_{2008}/F_{0.1}$ $F_{2008}/F_{30\%SPR}$	1.03-1.12 0.91 1.52 1.32
Management measures in effect	Driftnet ban [Rec. 03-04] Two month fishery closure

Outlook scenarios

- ✓ Seasonal closures of different durations
  - current (two-month)
  - four-months
  - six-months
- ✓ Capacity reduction 20%
- ✓ Catch quota
  - mean of last decade catch
  - 80% of the mean of the last decade catch

Considered:
- Uncertainty about recruitment (B/H relationship or stable)
- Risk of stock decline (i.e. SSB reductions of 10 or 20% from the current levels)

Outlook scenarios: results



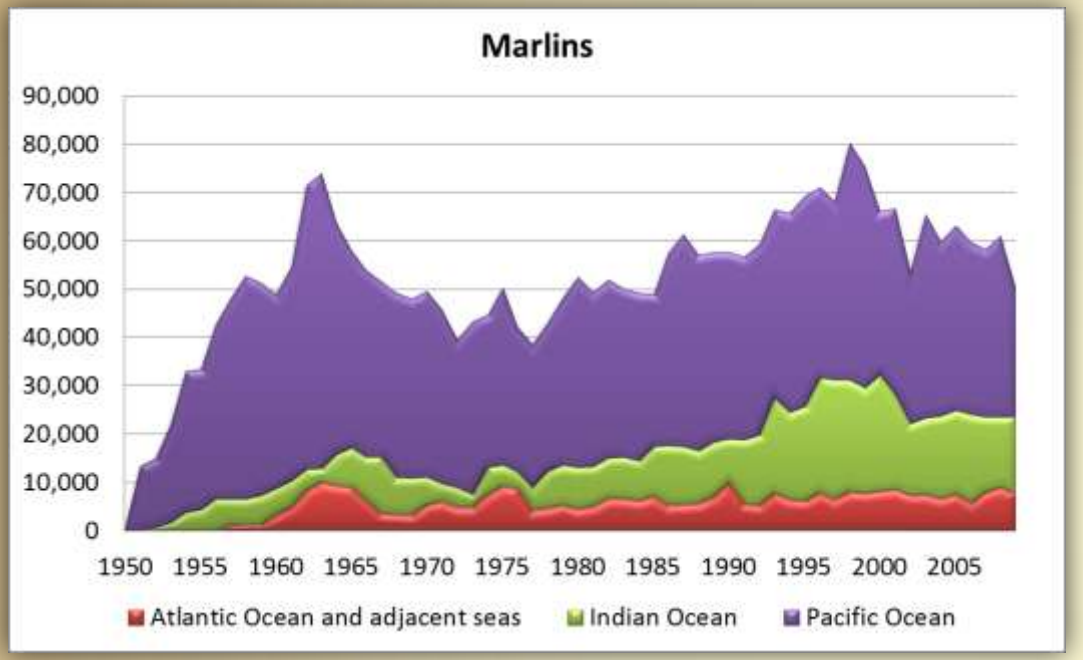
Outlook scenarios: conclusions

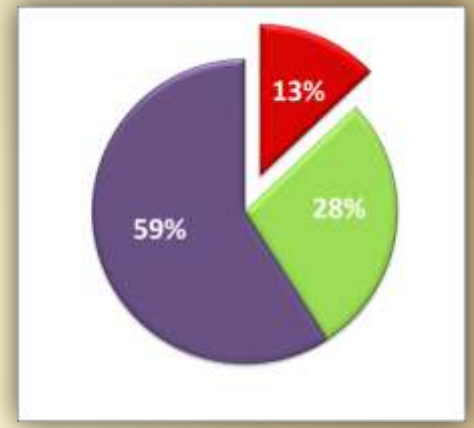
- Stock rebuilding to the middle 80's SSB levels can only be achieved in the case of **drastic seasonal closures** (up to 6 months) or relatively **low quotas.**
- SSB increases up to that corresponding to maximizing yield per recruit could be achieved **within a few generations (8-12 years) even under the current management status (2-month closure).** A small probability (<5%) of stock collapse still exists in this case.
- Benefits from seasonal closures would be diminished if closure is applied in months of low fishing activity (December-January).
- Long seasonal closures would result in significant catch reductions within the first few years after their application.
- Capacity reductions of 20% (assuming no compensation in effort) could rebuild the stock to optimal SSB levels.

Management recommendations

- Adopt a **management plan** with the goal of rebuilding the stock to levels that are consistent with the ICCAT Convention Objective.
- Simulations indicated that **seasonal closures have beneficial effects** and can move the stock condition to the level which will support MSY.
- The real effect of the recently employed two-month closure could not be evaluated due to incomplete 2009 data.
- **Technical modifications of the long-line gear,** as well as **capacity reductions** should be also considered in the framework of a management plan.

Marlins





% average catch in 2005-2010

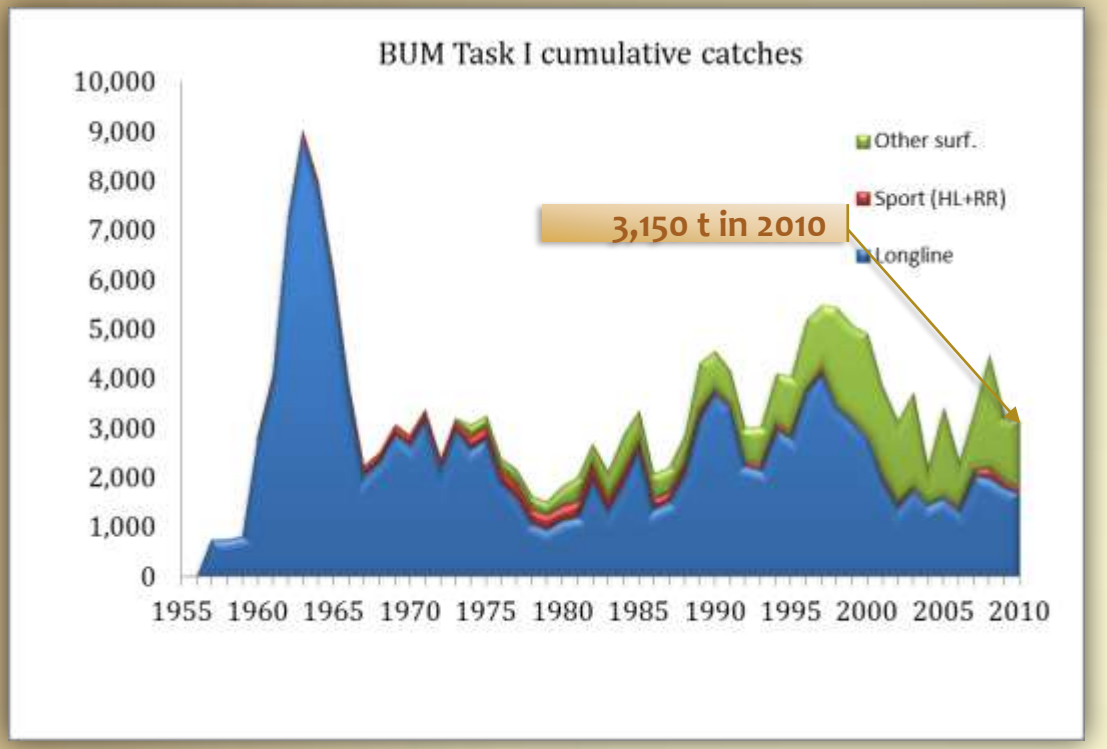
- **Atlantic** marlins represents **13% of the world production** (average 2005-2010).

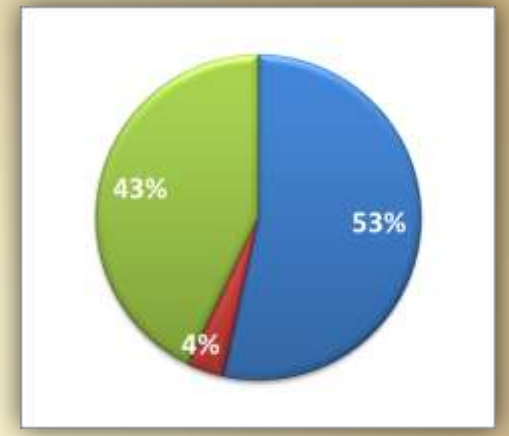
Blue marlin

Last assessment: 2011

1 management unit

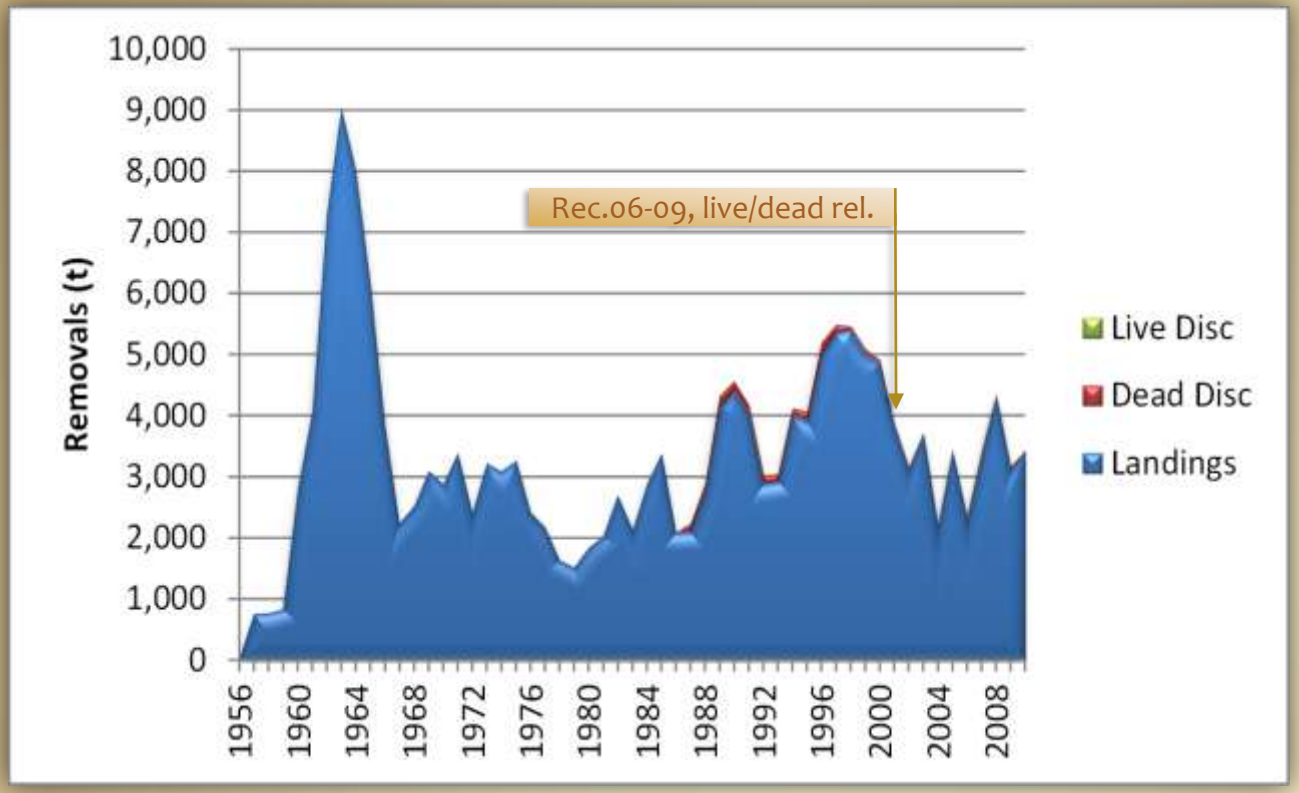
Blue marlin, Makaire bleu, aguja azul	
Scientific name	*Makaira nigricans*
Distribution	Widely distributed in subtropical and tropical waters of the Atlantic Ocean, and occasionally in temperate waters. From 50°N to 45°S, but they are less abundant in waters of the eastern central and the south central Atlantic
Spawning grounds	Mainly found in the tropical western areas of both hemispheres
Maturity	256 cm (females), 180 (males)
Life span	27 years (females), 18 years (males) in the Pacific; 11 years (tagging, longest time–at large in the Atlantic)
Maximum size	450 cm (910 kg); common sizes in the northwestern Atlantic are 180-300 cm LJFL
Natural mortality	Assumed M=0.139





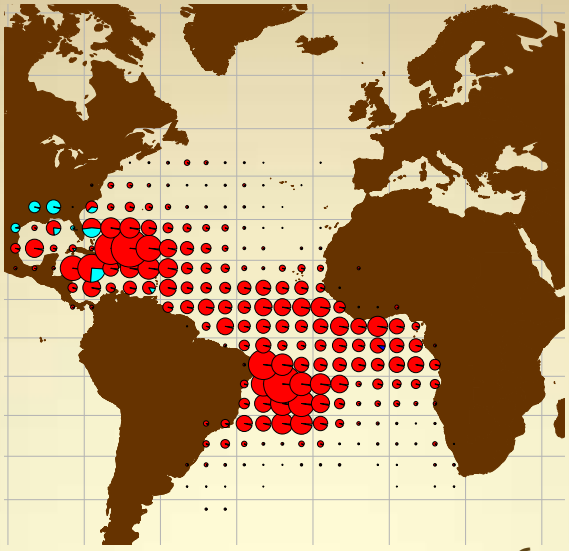
% average catch in 2006-2010

- Task I catches of BUM in 2010 were - 3,150 t (3,240 t in 2009).
- Due to the work conducted by the Committee and improved reporting by CPCs the amount of unclassified billfish in the Task I table has been minimized.

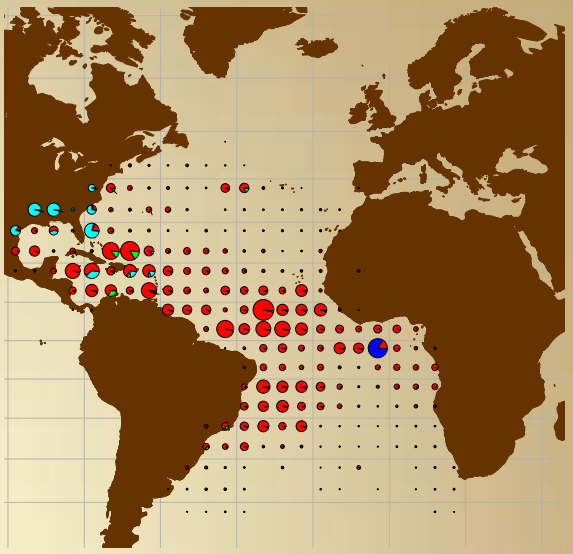


- Few CPCs reported Live Discards.
- Insufficient information on post- release survival precluded incorporation of potential mortality of the live discard fraction.

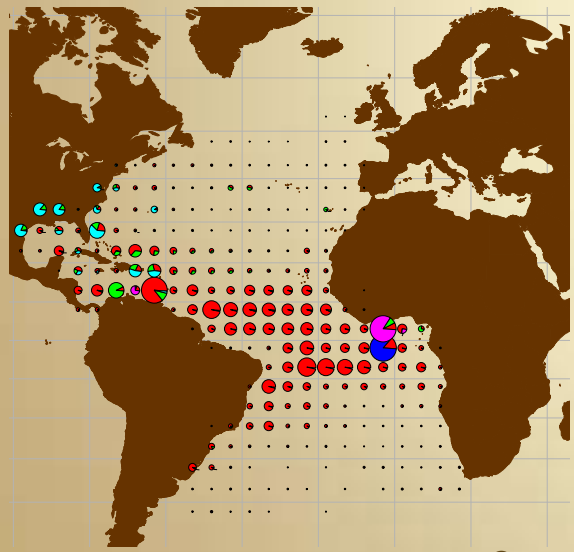
1950



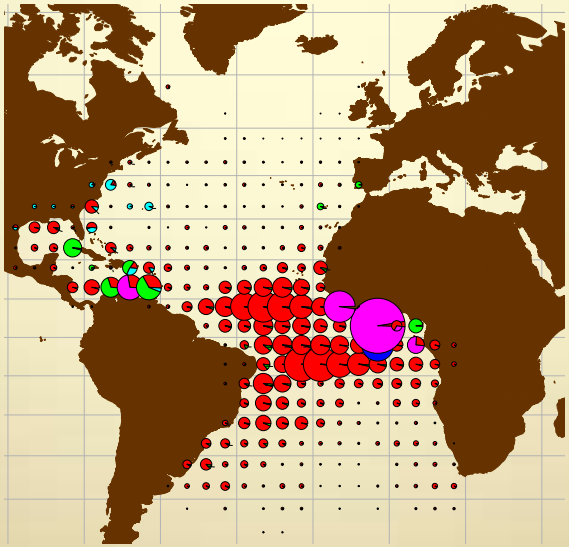
1960



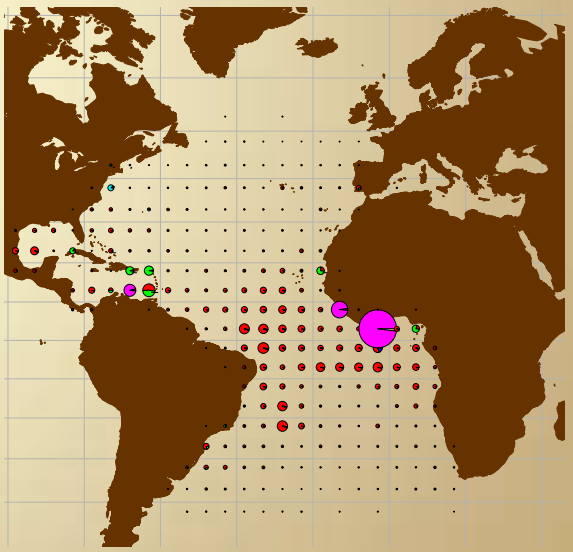
1970



1980

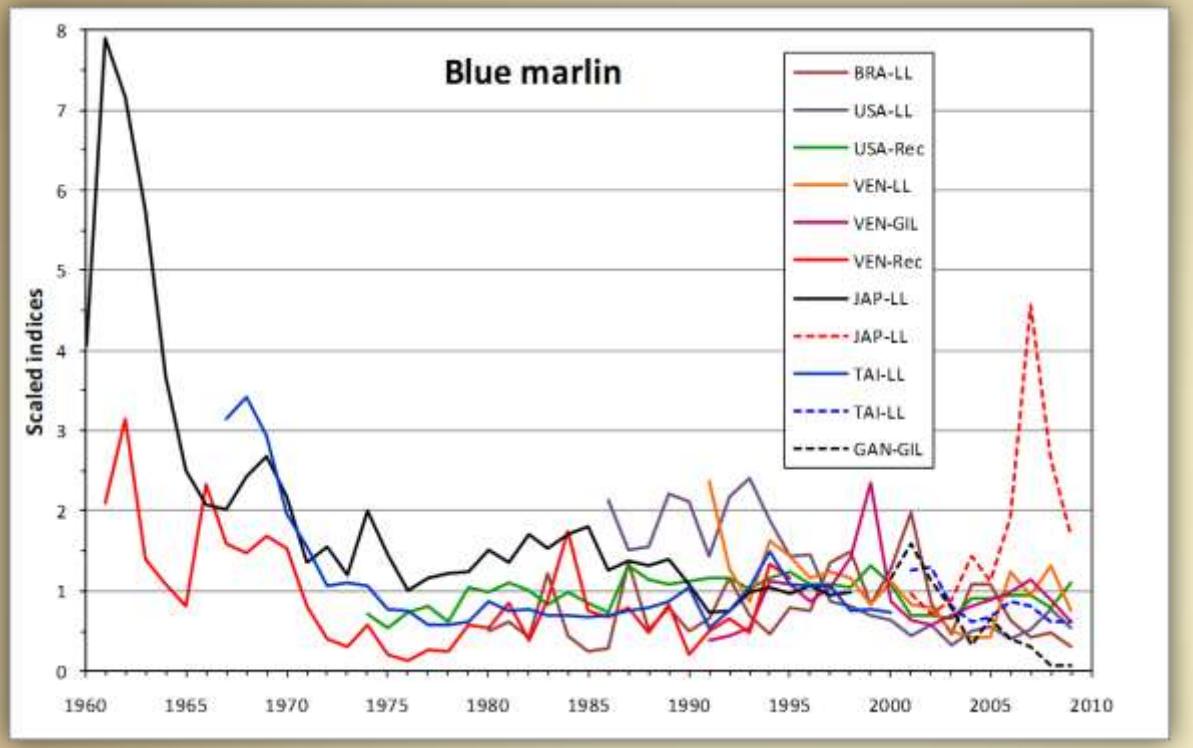


1990



2000

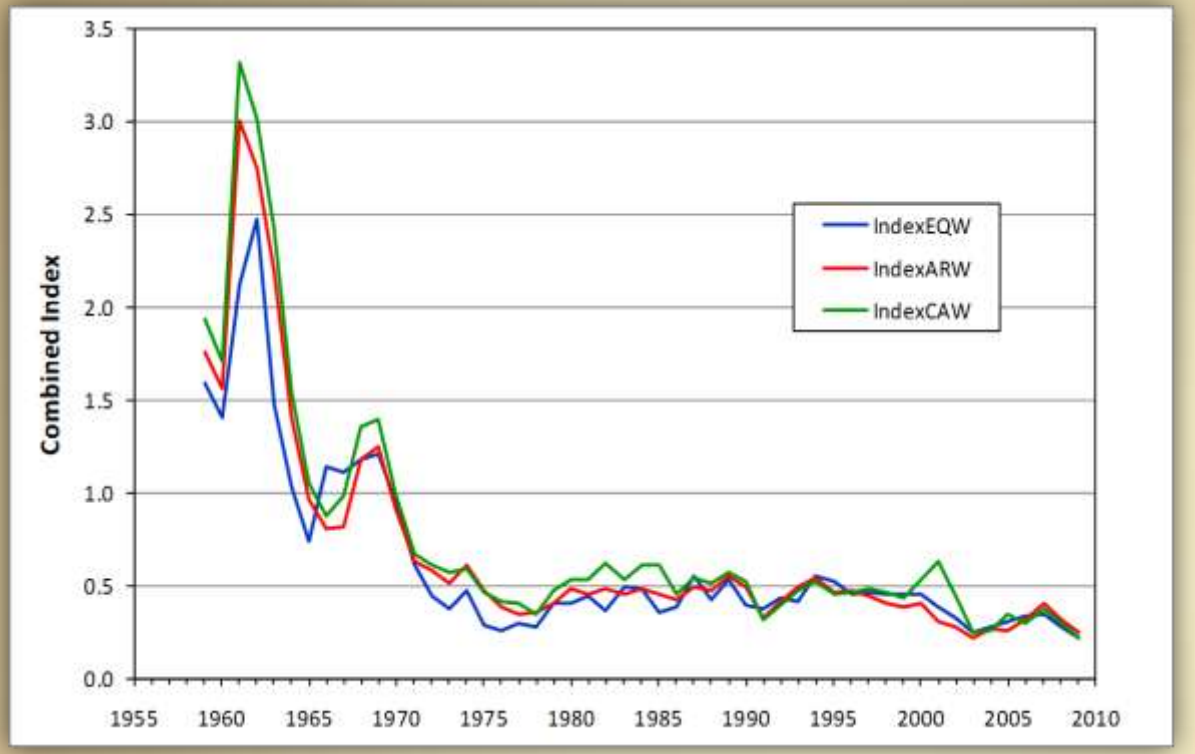
LL others PS RR GN



9 CPUE indices were used in the assessment (11 series):

Brazilian LL; USA LL, Rec; Venezuelan LL, GIL, REC; Japanese LL (1960-1998;2001-2009); Chinese-Taipei LL (1968-2000; 2001-2009); Ghana GIL.

Composite Blue marlin CPUE



- The GLM model included Year and Index source as factors

- The weighting scenarios used were:
  a) equal weighting, b) catch weight factor, and c) area weighting.

Stock status

Assessment Models used to provide Management Advice

- **ASPIC**
  Non-equilibrium production model
- **SS3**
  Fully integrated stock synthesis model

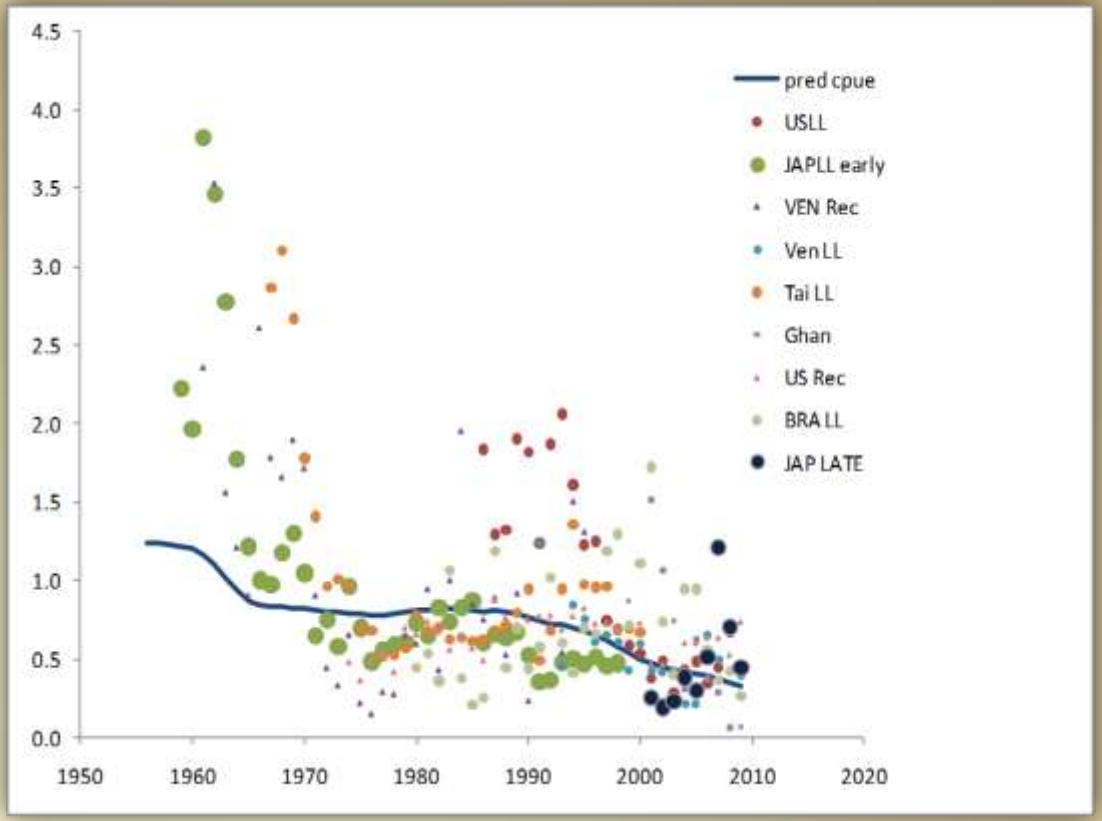
- ASPIC runs were **similar in structure to those used in the previous assessment.**
- Problems with the ASPIC model when using individual CPUE and Composite CPUE:
  1. Not converge.
  2. Converge, but unrealistic estimates.
- 2 alternative ASPIC runs were used to resolve the problem

Stock status

ASPIC

Non-equilibrium production model

Alternative 1



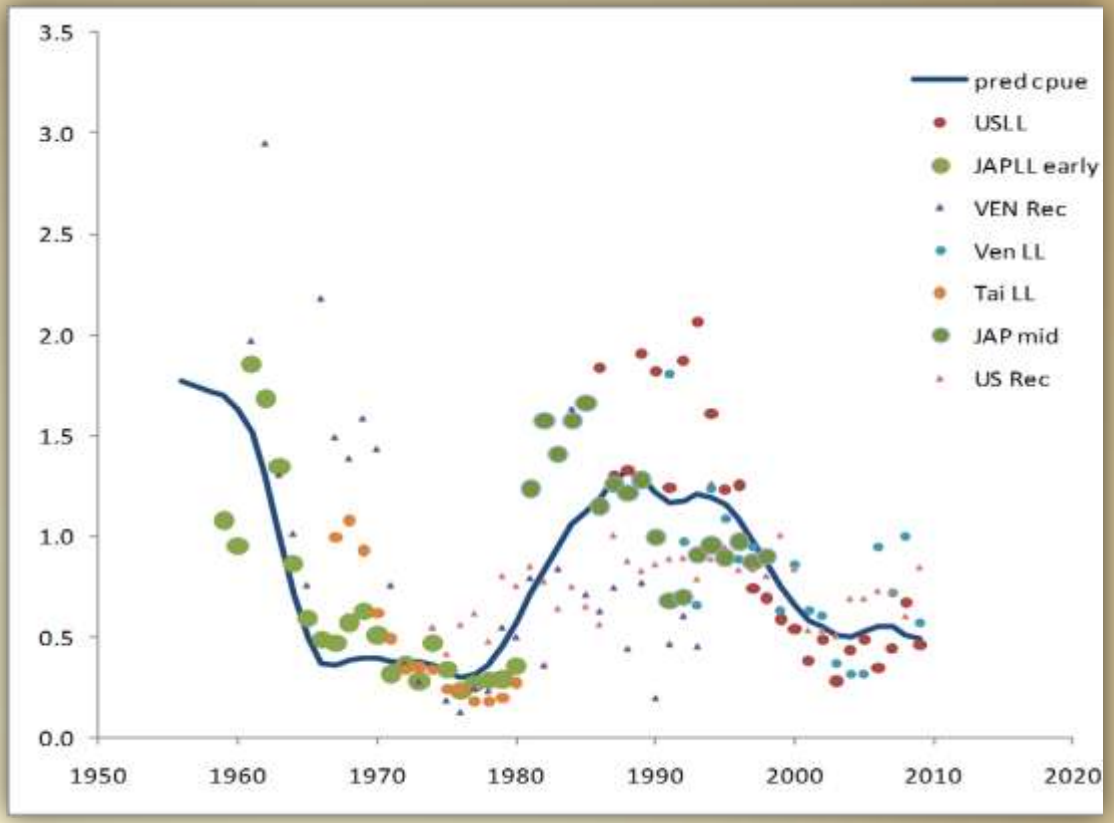
- Run with 9 indices, to estimate MSY, and K was assumed to be 100,000 t (to achieve convergence).
- Run named "**low productivity**" (MSY=2,700 t).
- Predicted CPUE showed difficulty in reconciling with long term catches.

Stock status

ASPIC

Non-equilibrium production model

Alternative 2



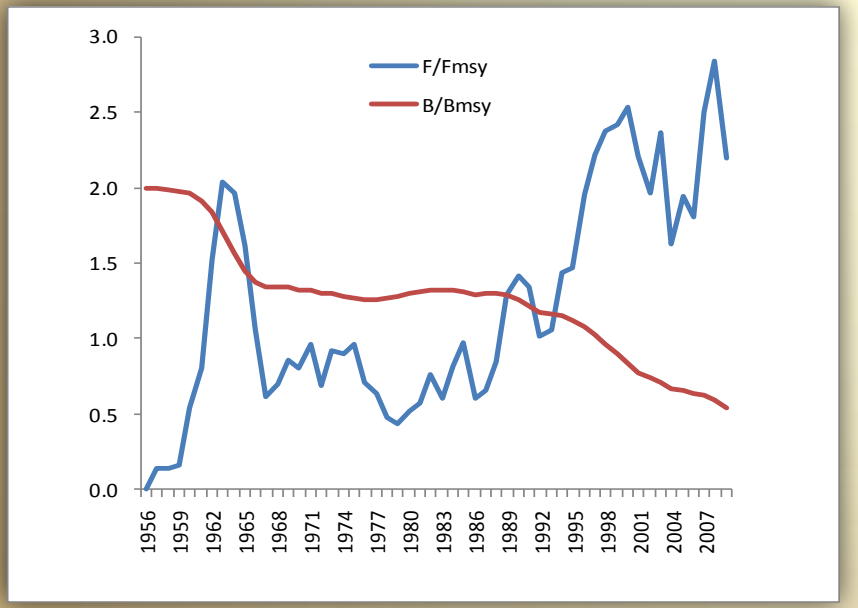
- Run with 7 CPUE indices (Brazil, Ghana, CH-Tai>1980, neg. correlated).
- Run named "**high productivity**" (MSY=4,300 t).
- Predicted CPUE become more informative.

Stock status

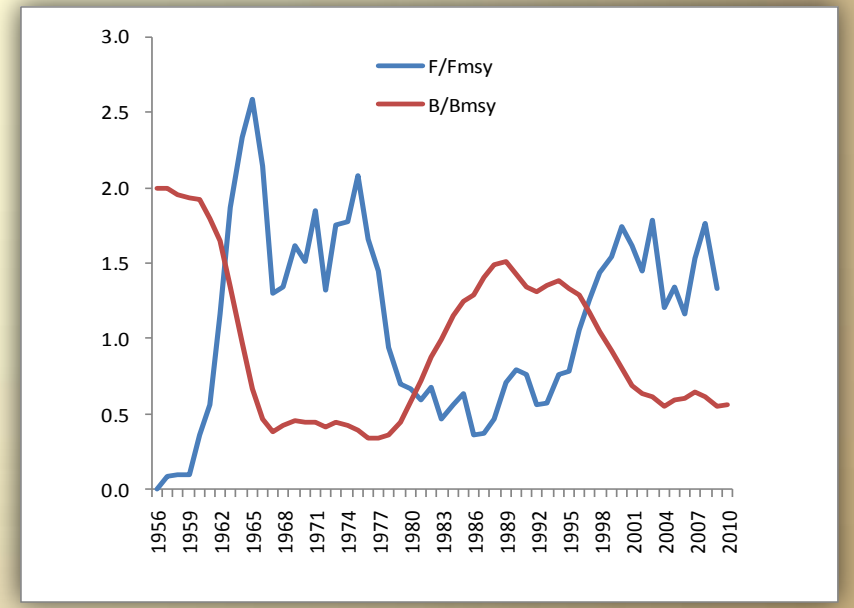
ASPIC

Non-equilibrium production model

- In both alternatives, stock status determinations were similar:
  Stock biomass $<B_{MSY}$; Fishing mortality $>F_{MSY}$
- CPUE indices not informative to determine how productive is the stock.
- The level of productivity (low or high) does not change the status of the stock: **Overfished and suffering Overfishing**



"low productivity" (MSY=2,700 t)



"high productivity" (MSY=4,300 t)

Stock status

SS3
Fully integrated stock synthesis model

The WG in 2010 recommended to progress with the application of a statistically integrated assessment model.

The model used:

- ✓ Catch
- ✓ CPUE as revised during the meeting
- ✓ Length data configured with four gear types
- ✓ One area
- ✓ One season

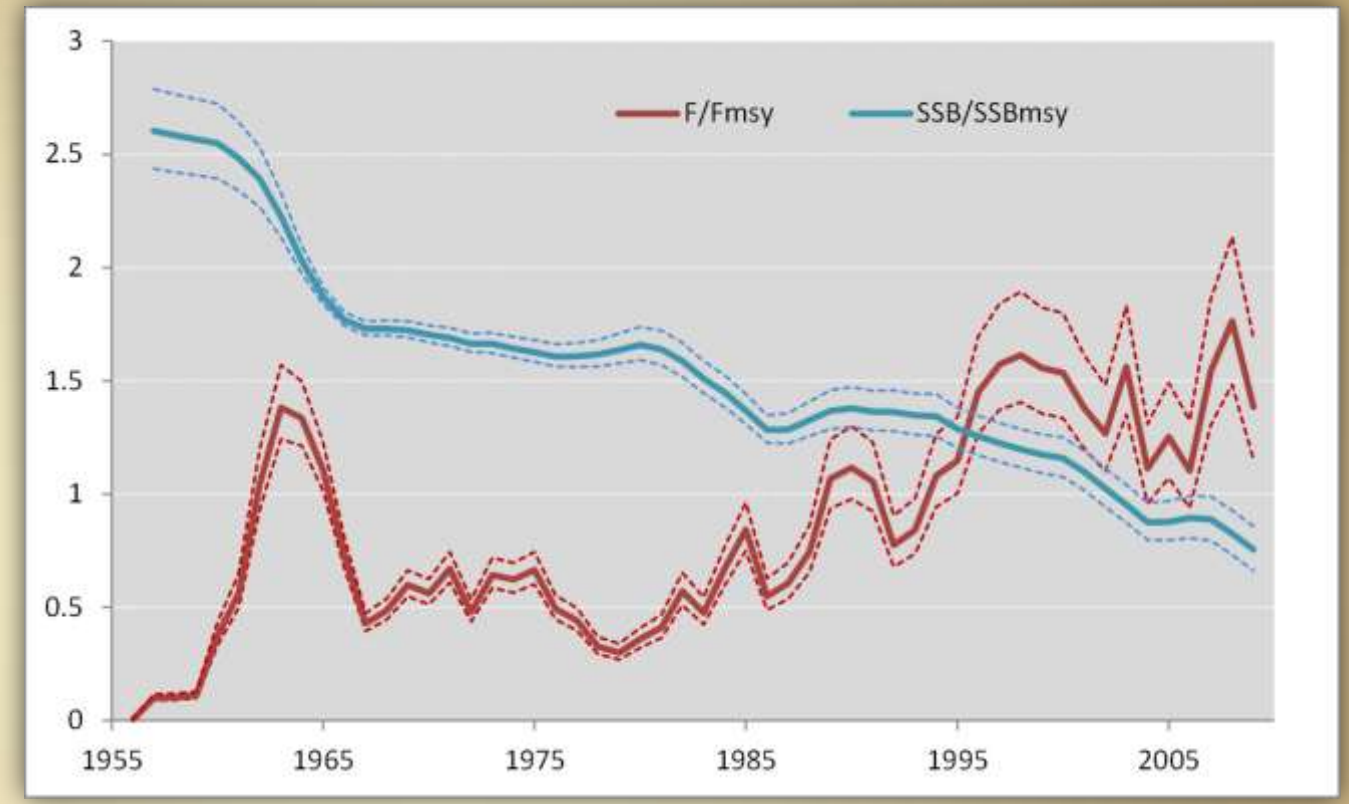
Estimated parameters included:

- ✓ Virgin recruitment
- ✓ Stock-recruitment steepness
- ✓ Annual recruitment deviations
- ✓ Fishery and survey catchabilities
- ✓ Gear specific selectivity parameters.

Stock status

SS3

Fully integrated stock synthesis model



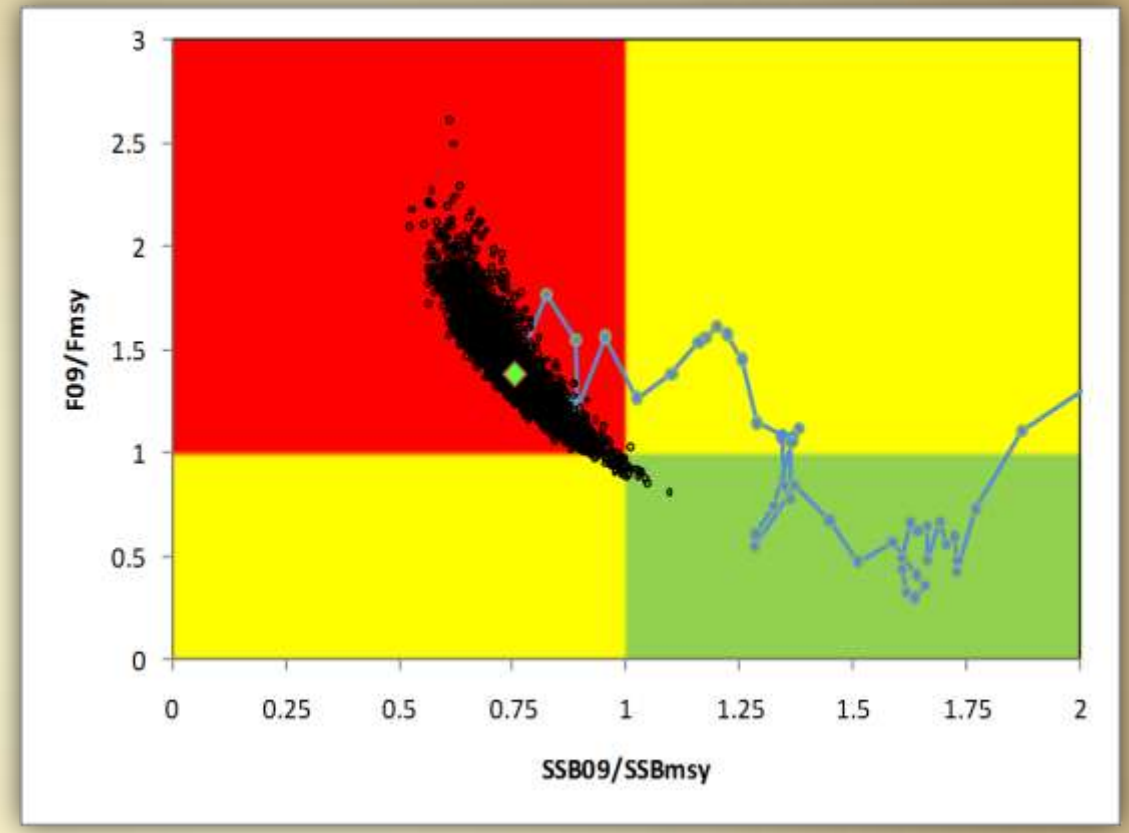
Results Base Case:

- Overfished (B/B_{MSY}=0.67)
- Under going overfishing (F/F_{MSY}=1.63)
- MSY=2,837 t

Stock status

SS3

Fully integrated stock synthesis model



- The results of the 2011 assessment indicated that the stock **remains overfished and undergoing overfishing.**

- This is in contrast to the results of the 2006 assessment which indicated that, even though the stock was likely overfished, the declining trend had partially stabilized.

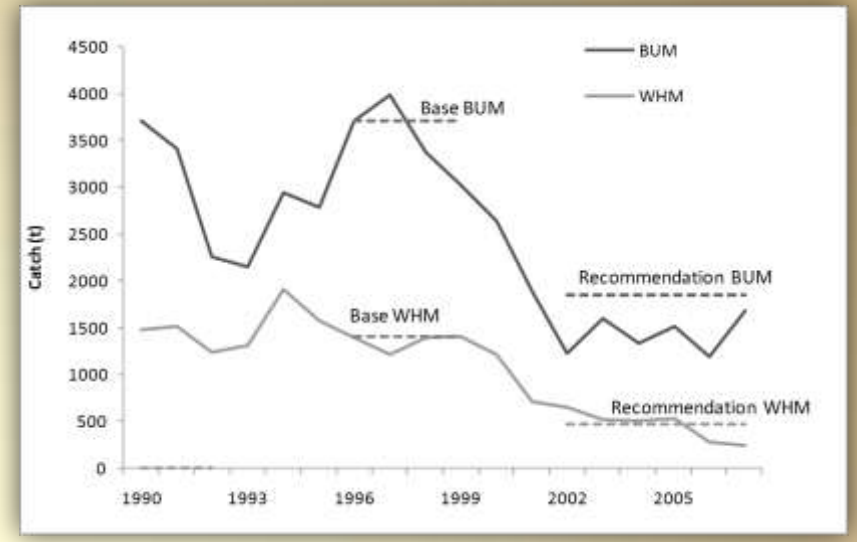
Outlook

	TAC								
Year	0	500	1000	1500	2000	2500	3000	3500	4000
2012	0%	0%	0%	0%	0%	0%	0%	0%	0%
2013	2%	2%	1%	1%	1%	1%	0%	0%	0%
2014	9%	6%	4%	3%	2%	1%	1%	0%	0%
2015	19%	13%	9%	6%	3%	2%	1%	0%	0%
2016	33%	23%	15%	9%	5%	3%	1%	0%	0%
2017	49%	35%	22%	13%	7%	3%	2%	0%	0%
2018	63%	47%	31%	18%	10%	4%	2%	0%	0%
2019	74%	58%	40%	24%	12%	5%	2%	1%	0%
2020	81%	67%	49%	30%	16%	6%	2%	1%	0%
2021	87%	74%	56%	36%	18%	7%	2%	0%	0%
2022	92%	80%	63%	41%	21%	8%	3%	0%	0%
2023	94%	84%	68%	46%	24%	9%	3%	0%	0%
2024	96%	88%	73%	50%	27%	10%	3%	0%	0%
2025	97%	91%	77%	55%	29%	11%	3%	0%	0%
2026	98%	93%	81%	59%	32%	12%	3%	0%	0%

- The results of the 2011 stock assessment indicated that **if the recent catch levels of blue marlin (3,240 t in 2009) are not substantially reduced, the stock will continue to decline further.**

- The **current management plan does not have the potential of recovering** the blue marlin stock to the BMSY level

Effects of current regulations



- Rec. 00-13, Rec. 01-10 and Rec. 02-13 placed additional catch restrictions for BUM and WHM.
- Rec. 02-13: "the annual amount of BUM that can be harvested by pelagic LL and PS and retained for landing must be no more than 33% for WHM and **50% for BUM of the 1996 or 1999 landing levels**, whichever is greater".

- Rec. 02-13: "All BUM and WHM brought to pelagic LL and PS alive shall be released in a manner that maximizes their survival" ("this does not apply to marlins that are dead when brought along the side of the vessel and that are not sold or entered into commerce").
- Catches of both species have declined since 1996-99, the period selected as the reference period by the recommendations. **Since 2002, the catch of BUM < 50% value recommended.**
- **PS** caught marlin represent **2%** of the total catch reported by the combination of PS and pelagic LL.

Effects of current regulations

- The Committee notes that the management plan developed by the Commission was based on the fact that at that time most BUM and WHM originated from industrial fisheries. Since then, the Committee noted a **significant increase in the contribution of non-industrial fisheries** to the total BUM and WHM harvest and that these fisheries are not accounted for in the current management plan.

- Some fisheries/fleets are using circle hooks, which can minimize deep hooking and increase the survival of marlins hooked on LL and recreational gear.

- More countries have started reporting data on live releases in 2006. Additionally, more information has come about, for some fleets, on the potential for using gear modifications to reduce the by-catch and increase the survival of marlins. Such studies have also provided information on the rates of live releases for those fleets. However there is **not enough information on the proportion of fish being released alive for all fleets**, to evaluate the effectiveness of the ICCAT recommendation relating to the live release of marlins.

Management recommendations

- BUM is below B_{MSY} and the fishing mortality above F_{MSY} (2009). Unless the recent catch levels (3,240 t, 2009) are substantially reduced, the stock will likely continue to decline. The COM should adopt a rebuilding plan for the stock of Atlantic BUM.

- The COM should implement management measures to immediately reduce fishing mortality on BUM stock by adopting a TAC that allow the stock to increase (2,000 t or less, including dead discards):

- To facilitate the implementation of the TAC, the Commission may consider the adoption of measures such as, but not limited to:

  a) Total prohibition of landings of BUM from pelagic LL and PS fisheries to improve the effectiveness of current management measures.
  b) Encouraging the use of alternative gear configurations that reduce the likelihood of deep hooking therefore increasing the post-release survival (for example, circle hooks) and/or reduce catchability (e.g., reducing the number of shallowhooks in a longline set, etc.).
  c) Broader application of time-area closures.
  d) Consider adopting measures to reduce fishing mortality of BUM from small-scale fisheries.

White marlin

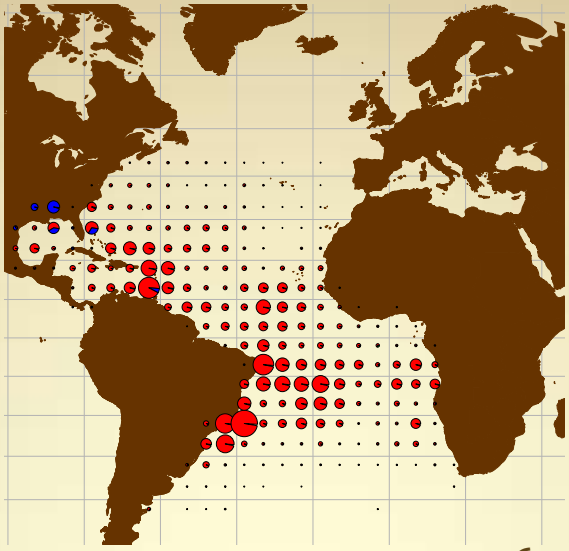
Last assessment: 2006

Data preparatory meeting: 2011

1 management unit

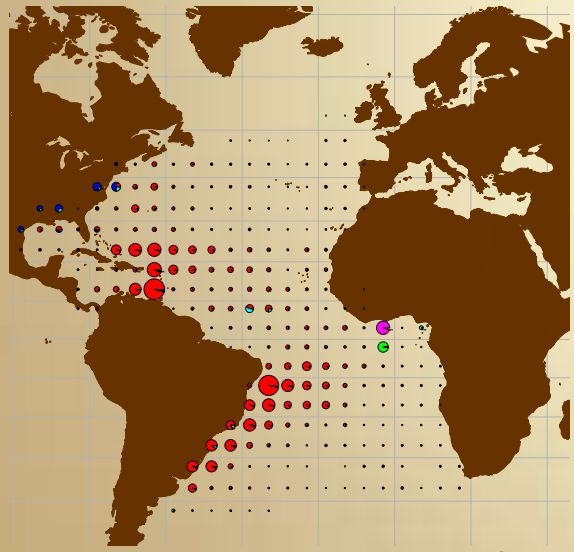
White marlin, Makaire blanc, aguja blanca	
Scientific name	*Tetrapturus albidus*
Distribution	Widely distributed in subtropical and tropical waters of the Atlantic Ocean, and occasionally in temperate waters and in the Mediterranean Sea. From 55°N to 45°S, but they are less abundant in waters of the eastern central south central Atlantic.
Spawning grounds	Mainly found in the tropical western areas of both hemispheres
Maturity	149-190 cm (females) / 139 cm (males)
Life span	15 years (tagging, longest time–at large in the Atlantic)
Maximum size	280 cm (82 kg);); common sizes are 150-180 cm LJFL
Natural mortality	Range from 0.15 to 0.30

1950



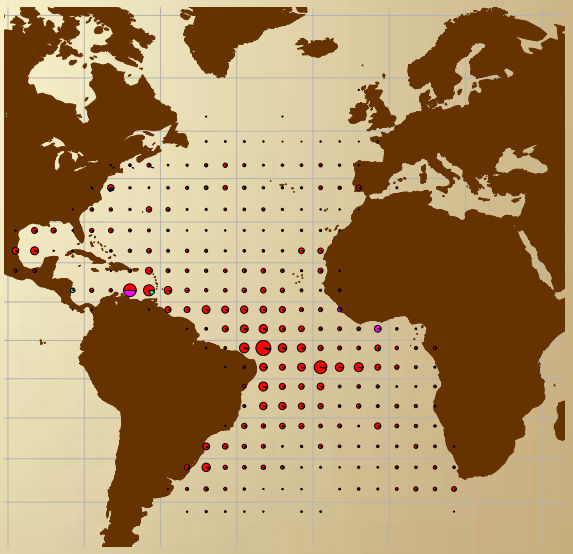
1960

1970



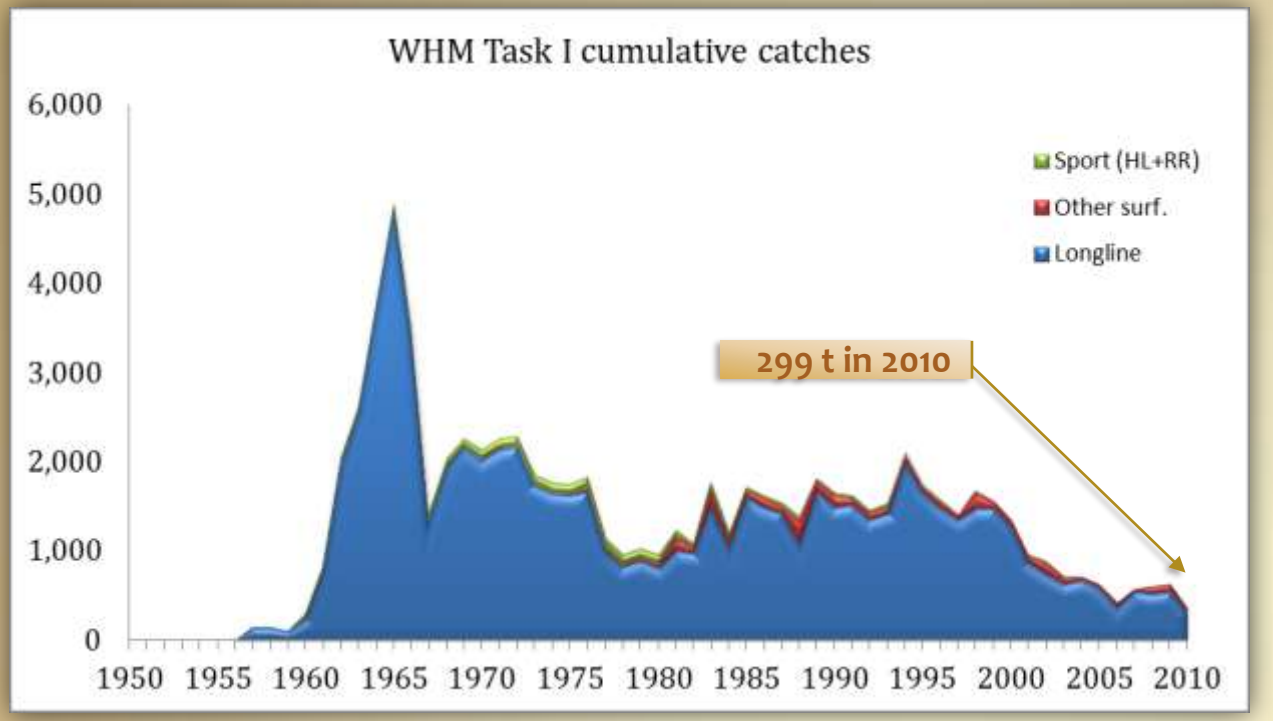
1980

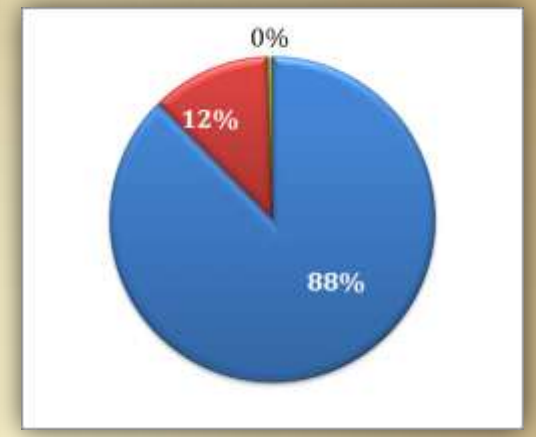
1990



2000

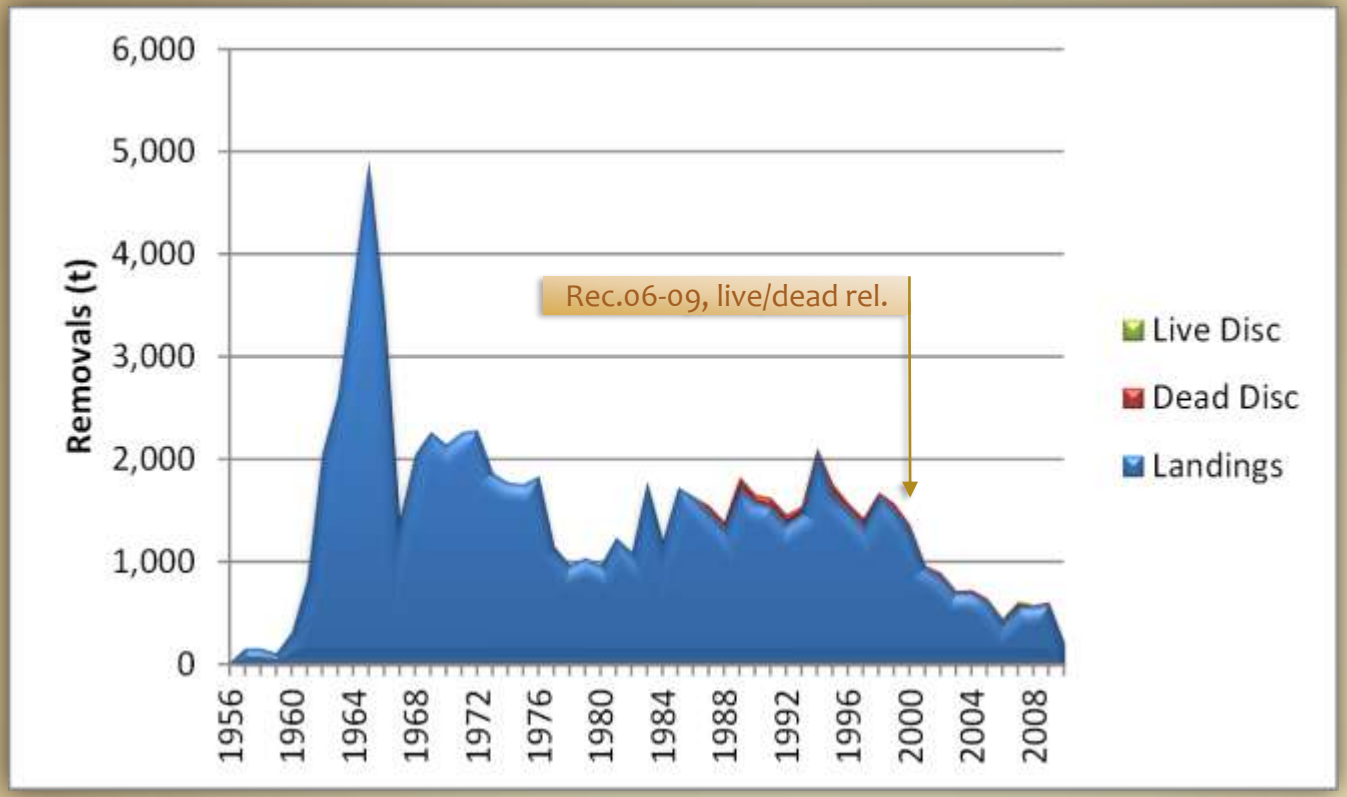
LL PS RR others GN





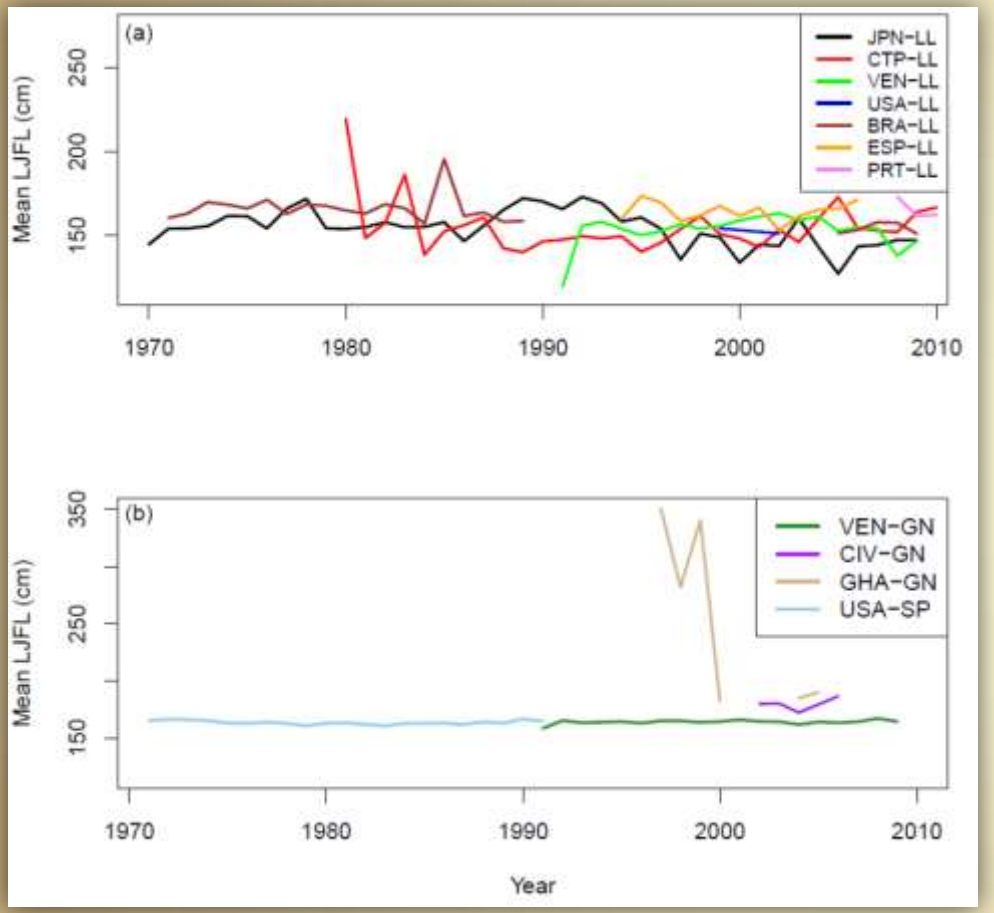
% average catch in 2006-2010

- Catches of WHM seemed to be **stabilizing**.
- Task I catches of WHM in 2009 and 2010 were 644 t and **299 t**, respectively.
- Due to the work conducted by the Committee and improved reporting by CPCs the amount of unclassified billfish in the Task I table has been minimized.



- Few CPCs reported Live Discards.

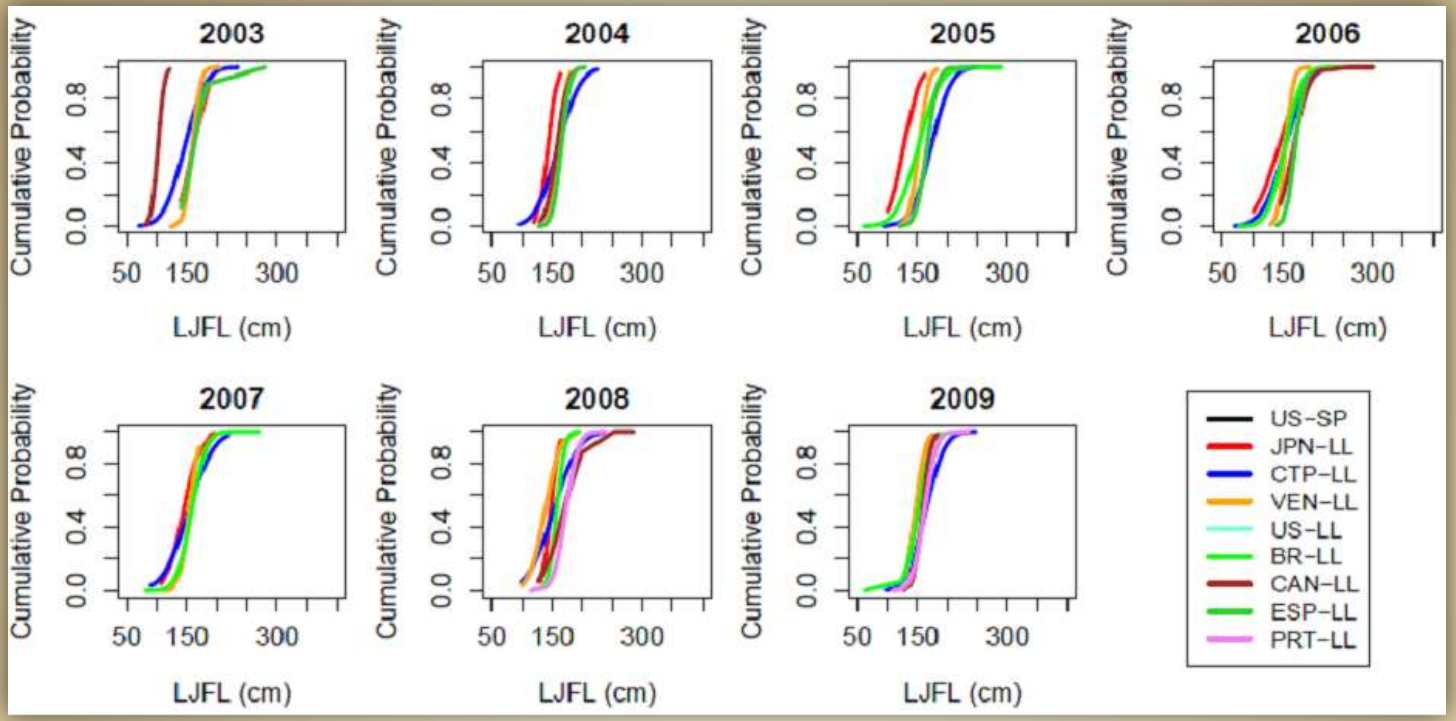
Size frequency analysis



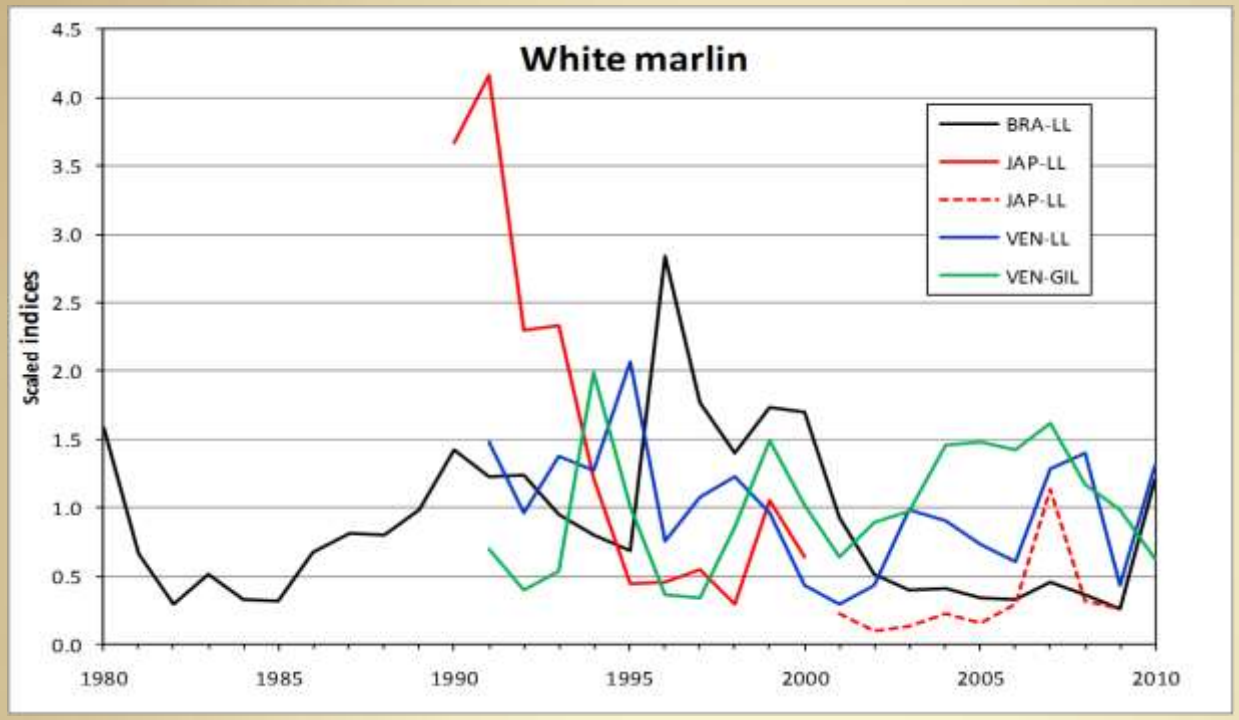
Analysis focused on data from fisheries that constituted the bulk of the WHM catch.

Basic summary statistics were calculated for each fishery by year.

Size frequency analysis



- Plots of cumulative probability across the observed range of LJFL by year were generated for the various fisheries.
- The plots indicate **consistent patterns of size-selectivity for WHM across fisheries and through time.**
- These data are essential for conducting integrated stock assessments, and it was recommended that greater emphasis be placed on the **collection and reporting of size-frequency data by CPCs.**



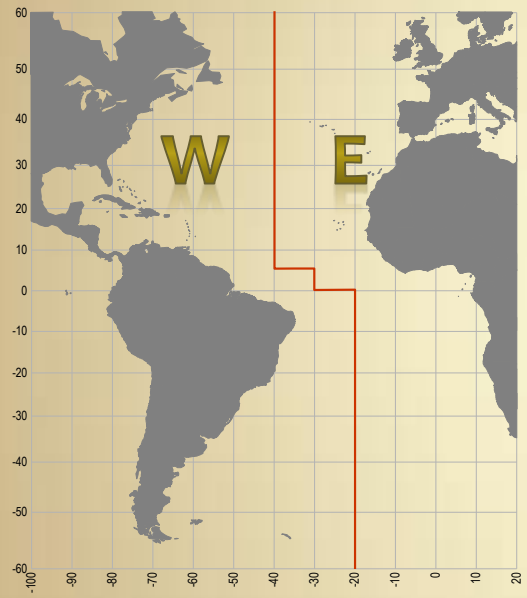
6 CPUE index were reviewed during data preparatory meeting

Brazilian LL; Venezuelan LL, GIL; Japanese LL (1960-1998;2001-2009); Chinese-Taipei LL (1968-2009).

Conclusions from the WHM Data Preparatory Meeting

- The WHM historical reported catches may comprise **a mixture of species,** like *Tetrapturus georgii* (RSP) and *T. pfluegeri* (SPF) in addition WHM.
- Therefore, it is recommended that the WHM stock assessment to be conducted in 2012 be considered as **mix species stock assessment.**
- Estimation of **relative abundance indices** at the highest spatio-temporal resolution **from all CPCs are needed,** especially from those CPCs that have important catches of white marlin.
- Relative abundance indices to be provided **need to take into consideration the effect of current regulations in the standardization process.**

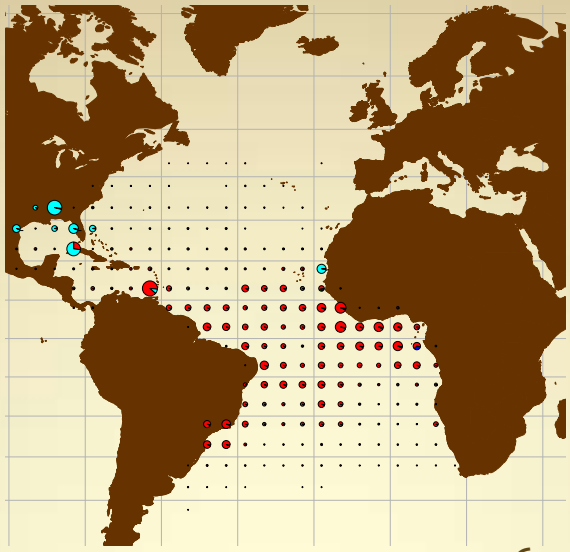
Last assessment: 2009



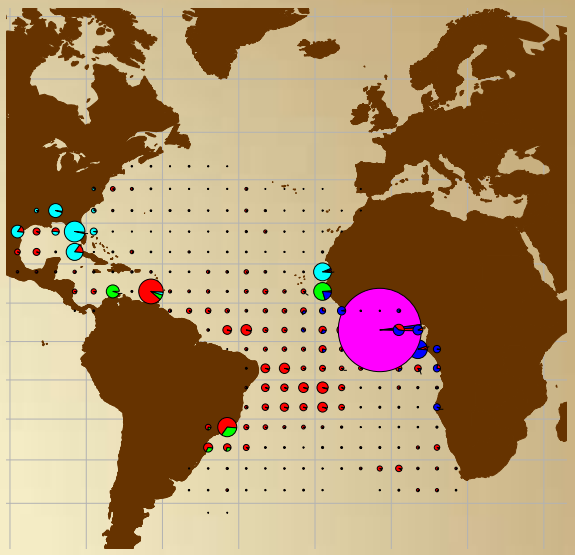
2 management units

Sailfish, Voiliere, Pez Vela	
Scientific name	*Istiophorus albicans*
Distribution	Widely distributed in subtropical and tropical waters of the Atlantic , and occasionally in temperate waters and in the Mediterranean Sea. It is the least oceanic of the Atlantic billfishes; shows a strong tendency to approach continental coasts, islands and reefs.
Spawning grounds	Tropical areas of both hemispheres (almost year round)
Maturity	147-160|180 cm LJFL (females) / 135.7 cm LJFL cm (males)
Life span	13-15 years
Maximum size	up to 230 cm LJFL
Natural mortality	Range from 0.15 to 0.30

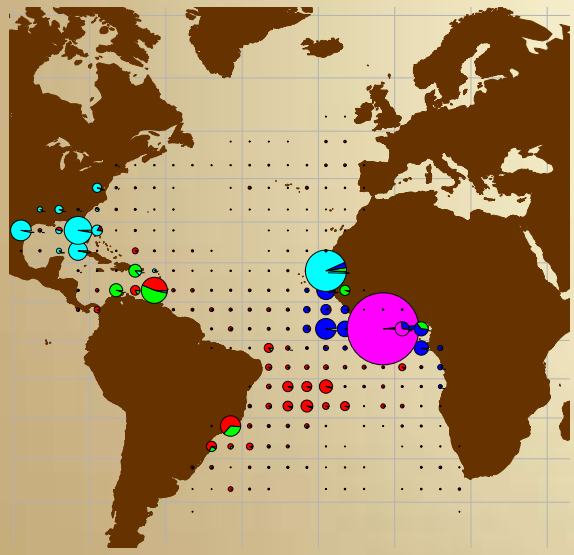
1950



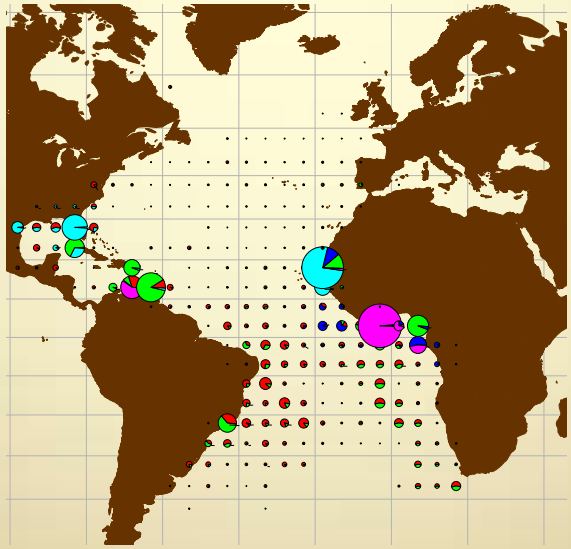
1960



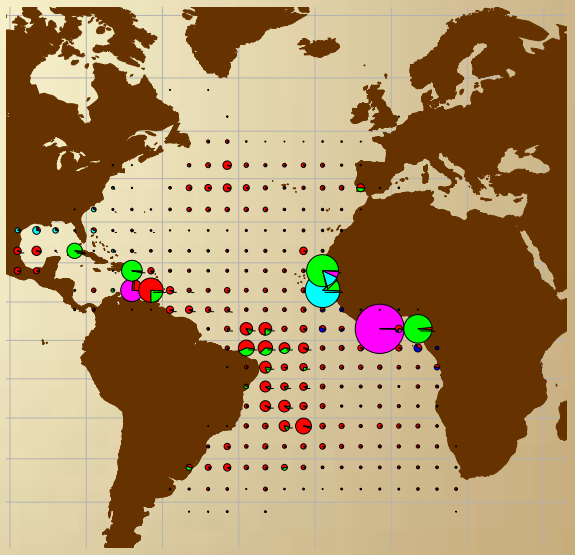
1970



1980

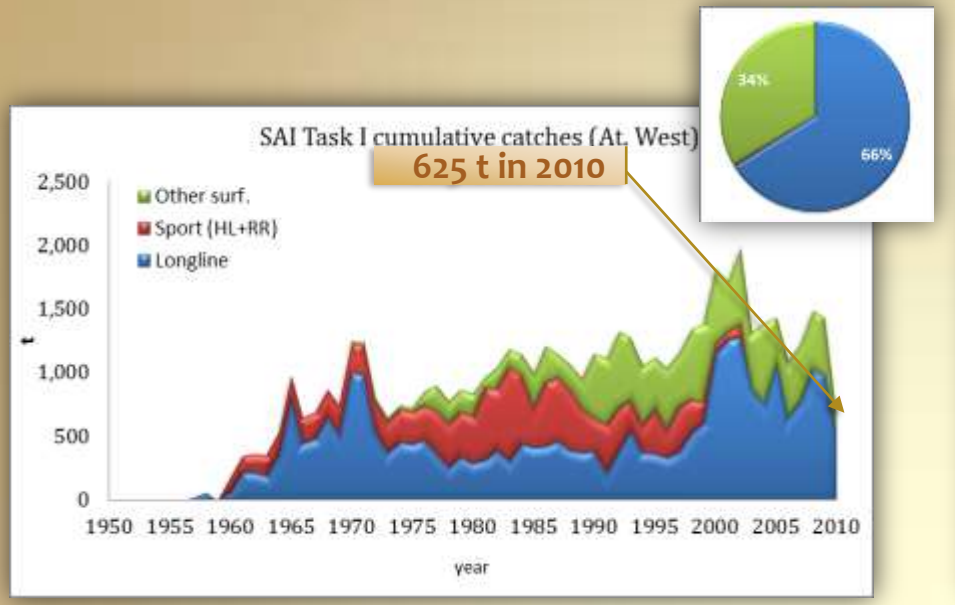


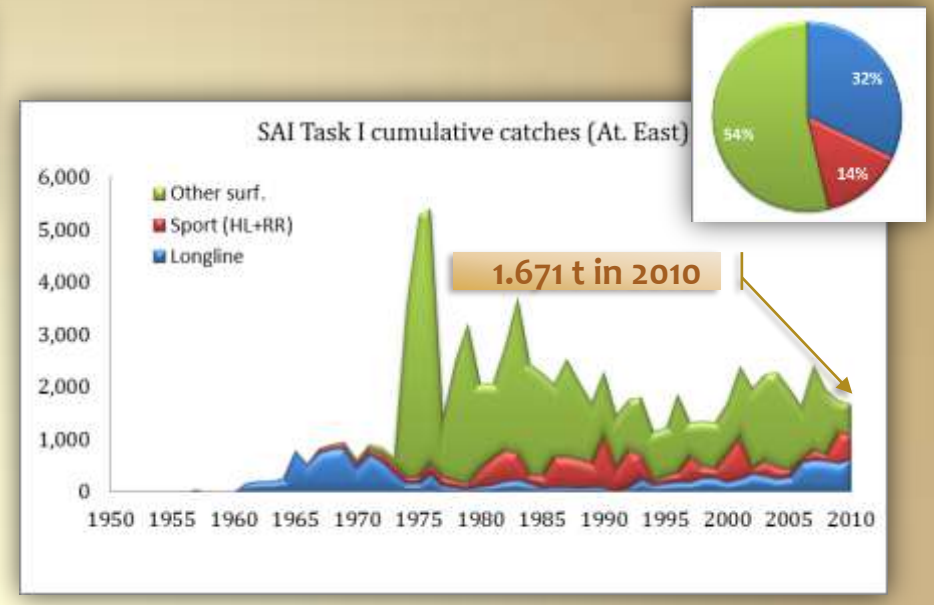
1990



2000

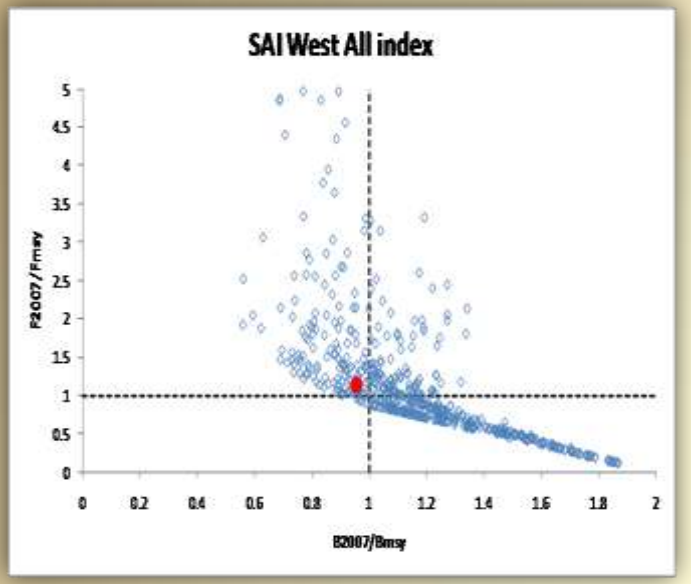
LL others PS sport GN

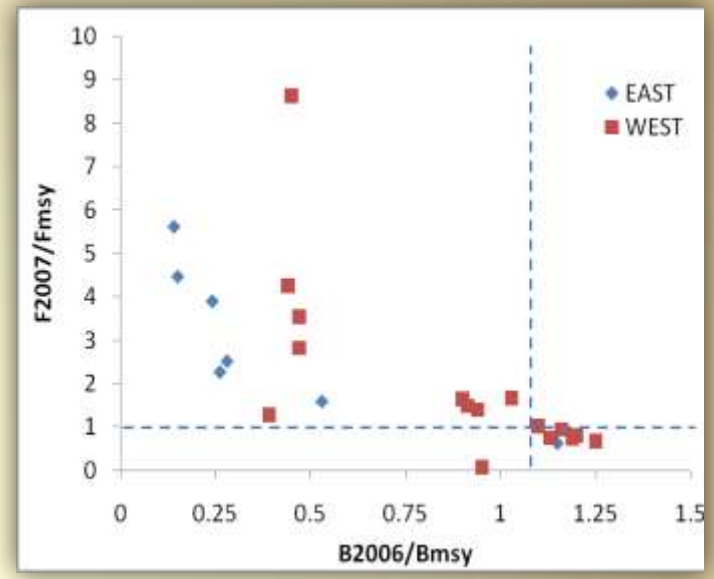




- SAI are targeted by coastal artisanal and recreational fleets and are caught as by-catch in LL and PS.
- Historically, catches of SAI were reported together with spearfish by many LL fleets, making the estimation of SAI catch difficult.
- Incomplete reporting of sailfish catches, particularly for the most recent years.

Stock status





SAI Summary	West Atlantic	East Atlantic
MSY	600-1,100 t	1,250-1,950 t
2010 catches (prov.)	**625 t**	**1,671 t***
B_{2007}/B_{MSY}	Possibly <1.0	Likely <1.0
F_{2007}/F_{MSY}	Possibly <1.0	Likely <1.0
2008 Replacement Yield	Not estimated	Not estimated
Management measures in effect	None	None

Outlook

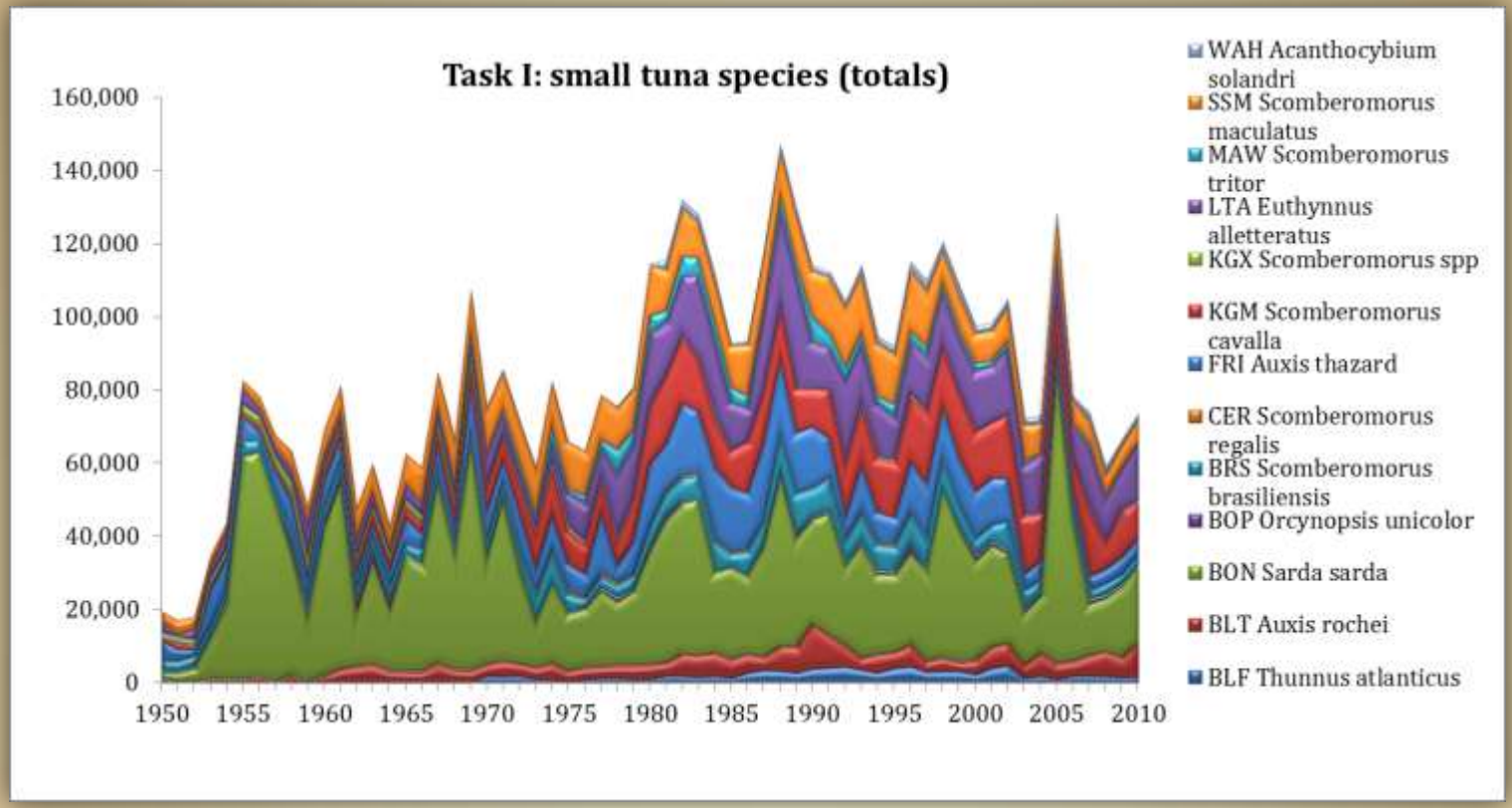
- Both the eastern and western stocks of sailfish may have been reduced to stock sizes **below B_{MSY}**.
- There is considerable **uncertainty** on the level of reduction, **particularly for the west,** as various production model fits indicated the biomass ratio B_{2007}/B_{MSY} both above and below 1.0.
- The results for the **eastern stock** were **more pessimistic** than those for the western stock in that more of the results indicated recent stock biomass below B_{MSY}.
- Therefore there is **particular concern over the outlook for the eastern stock.**

Management recommendations

- **Catches for the eastern stock** should be **reduced** from current levels.
- **Catches of the western stock should not exceed current levels,** but reduction in catch in the West Atlantic is likely to help stock re-growth and reduce the likelihood that the stock is overfished.
- Concern was expressed about the **incomplete reporting of SAI catches,** particularly for the most recent years, because it increases uncertainty in stock status determination.
- The Committee recommends all countries landing or having dead discards of SAI, **report** these data.

Small tunas

- BLF Blackfin tuna (Thunnus atlanticus)
- BLT Bullet tuna (Auxis rochei)
- BON Atlantic bonito (Sarda sarda)
- BOP Plain bonito (Orcynopsis unicolor)
- BRS Serra Spanish mackerel (Scomberomorus brasiliensis)
- CER Cero (Scomberomorus regalis)
- FRI Frigate tuna (Auxis thazard)
- KGM King mackerel (Scomberomorus cavalla)
- KGX Scomberomorus unclassified (Scomberomorus spp.)
- LTA Little tunny (Euthynnus alletteratus)
- MAW West African Spanish mackerel (Scomberomorus tritor)
- SSM Atlantic Spanish mackerel (Scomberomorus maculatus)
- WAH Wahoo (Acanthocybium solandri)
- DOL Dolphinfish (Coryphaena hippurus)



- Small tuna species have a very **high relevance from a socio-economic point of view**, because they are important for many coastal communities in all areas and are a main source of food.
- Small tunas are exploited mainly by **coastal fisheries and artisanal fisheries**, although substantial catches are also made as target species and as by-catch by purse seine, mid-water trawlers (i.e., pelagic fisheries of West Africa Mauritania), handline and small scale gillnets.

Most dominant species in the catches (5 species, more than 80% in weight)

Atlantic bonito *(Sarda sarda)*

Frigate tuna (*Auxis thazard*)

King mackerel (*Scomberomorus cavalla*)

Little tunny (*Euthynnus alletteratus*)

Atlantic Spanish mackerel (*Scomberomorus maculatus*)

STOCK STATUS

- The stocks' structures are not well known, because there is a little information available.
- The small amount of information available does not allow to carry out an assessment of stock status of the majority of the species.
- If data availability improves with the same trend of the latest years, it will be possible to do some analyses in the future.

CURRENT REGULATIONS

- No ICCAT regulations are in effect for SMT species.
- Few regional and national regulations are in place.

Knowledge on the biology and fisheries of SMT is very fragmented in several areas because :

- ✓many of these species are often perceived to have little economic importance;
- ✓Caught by various fisheries(artisanal, coastal, industrial, recreational, & sport);
- ✓ difficulties in conducting sampling of the landings from artisanal fisheries (high proportion of the fisheries);
- ✓ large industrial fleets often discard small tuna catches at sea or sell them on local markets mixed with other by-catches;
- ✓Misidentification of species.

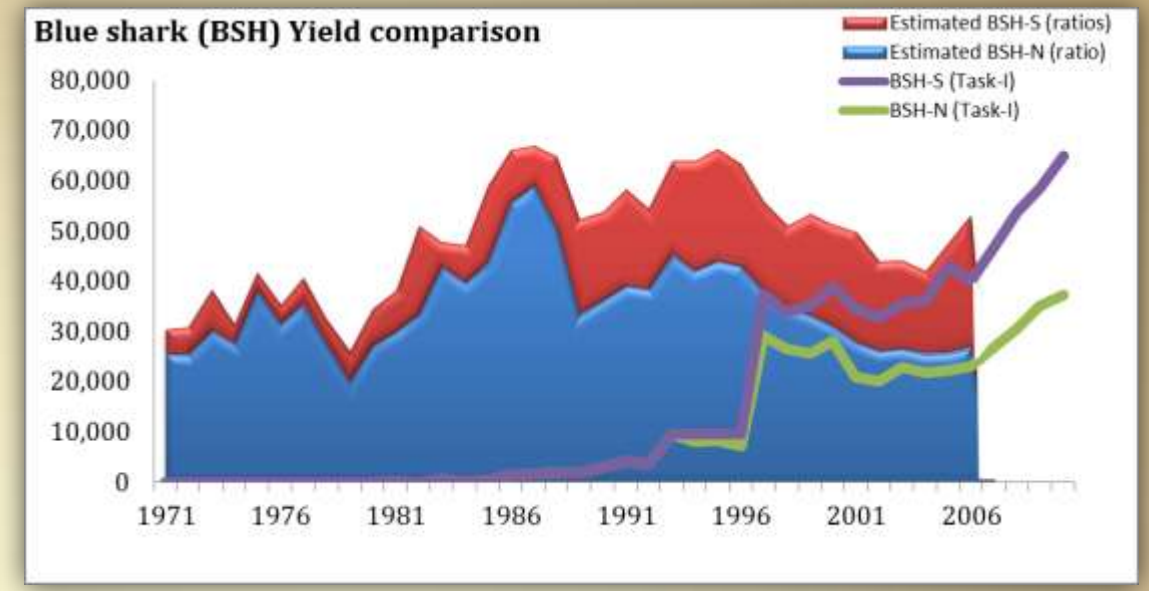
Scientific collaboration between ICCAT and countries in the various regions is imperative to advance understanding of the distribution, biology and fisheries of these species

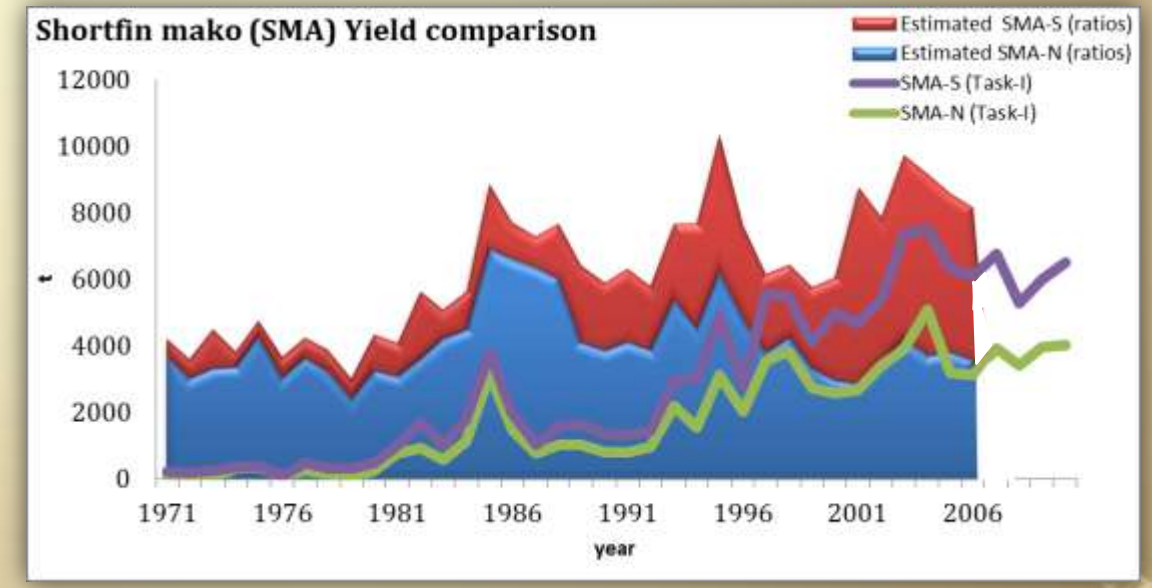
Sharks

Last assessment: 2008-09

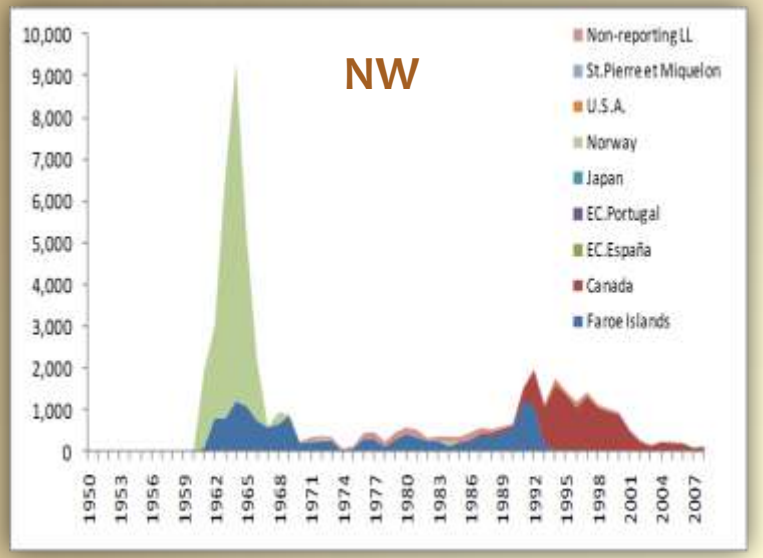
Fishery indicators

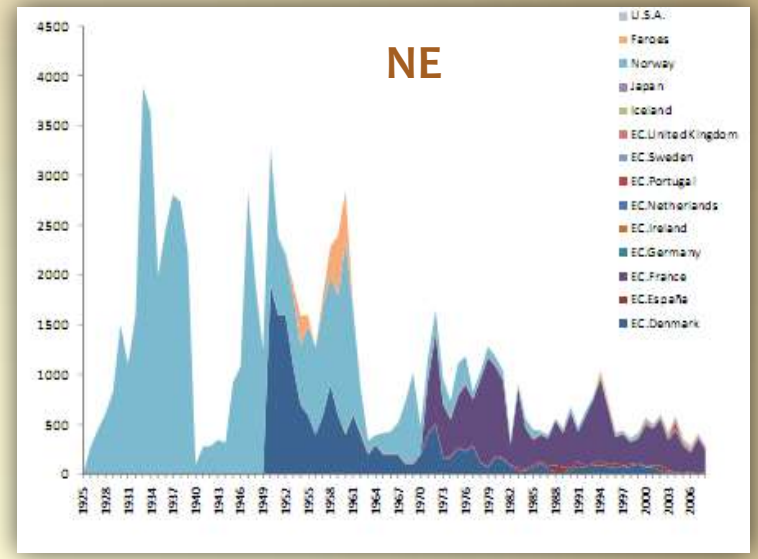
Though **global statistics on SHK catches** included in the ICCAT database have **improved,** they are **still insufficient** to permit the SCRS to provide quantitative advice on stock status with sufficient precision to guide fishery management toward optimal harvest levels.

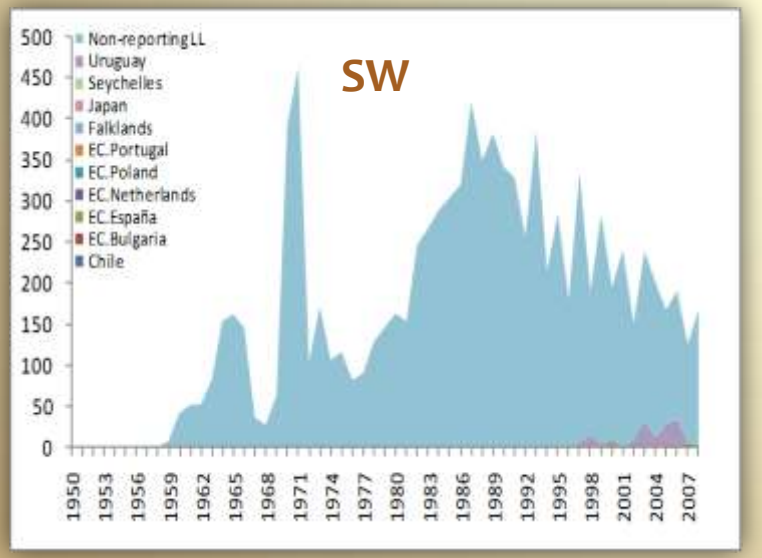




Fishery indicators (porbeagle)

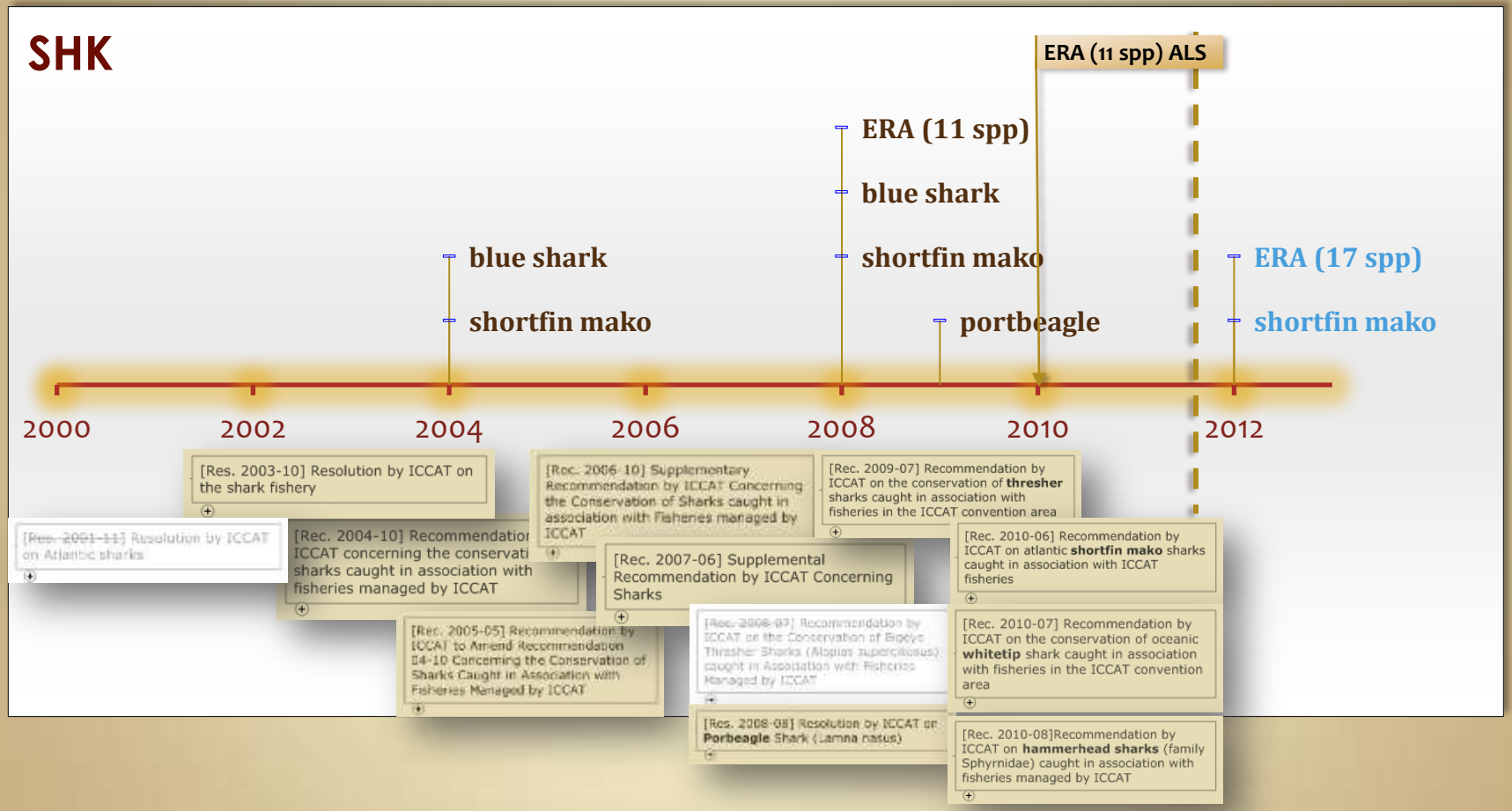






Though **global statistics on SHK catches** included in the ICCAT database have **improved,** they are **still insufficient** to permit the SCRS to provide quantitative advice on stock status with sufficient precision to guide fishery management toward optimal harvest levels.

Timeline of SHK Stock Assessments & Management recommendations



ERA 2008 (revised in Cortés et al., 2010)

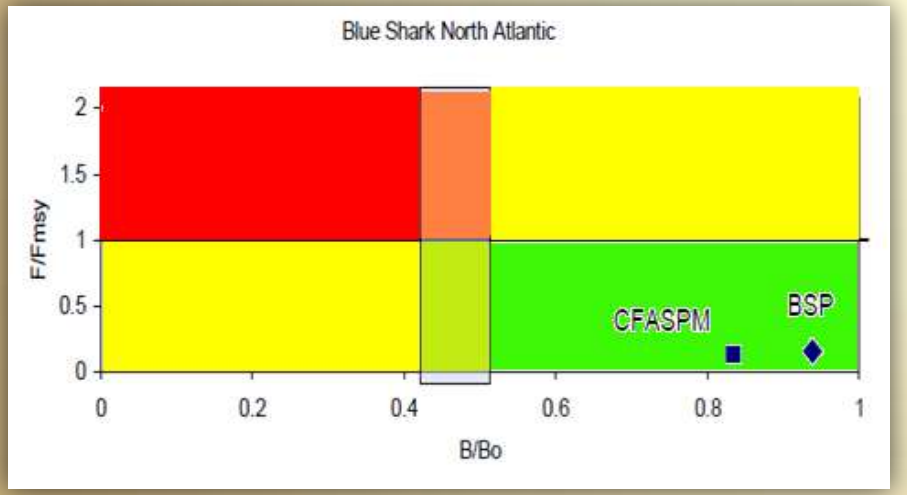
2008

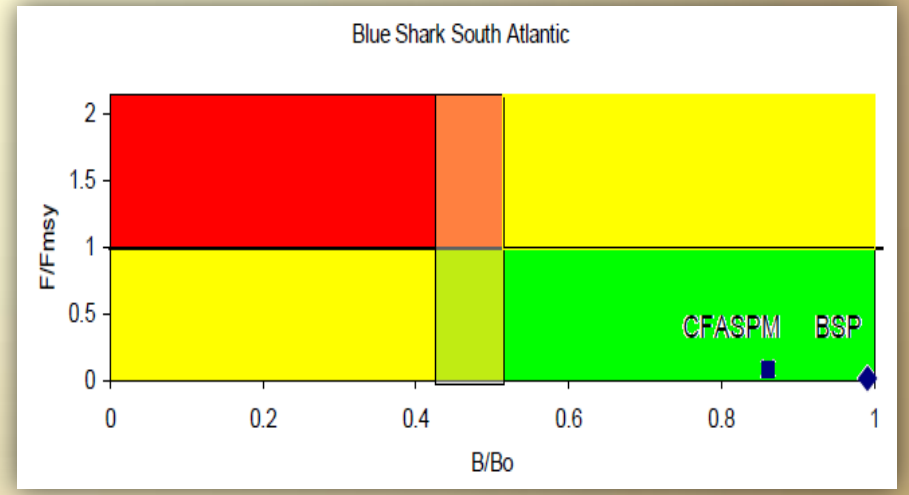
Code	Species (Eng)	Species (Spa)	Species (sci)	Prod (r)	Suscept	Vuln. Rank	Vuln. Rank
FAL	Silky shark	Tiburón jaquetón	*Carcharhinus falciformis*	*0.063*	*0.759*	**1**	**6**
SMA	Shortfin mako	Marrajo dientuso	*Isurus oxyrinchus*	*0.018*	*0.741*	**2**	**2**
				0.073_{2004}	*0.741*	**3**	**5**
BTH	Bigeye thresher	Zorro ojón	*Alopias superciliosus*	*0.01*	*0.684*	**4**	**1**
OCS	Oceanic whitetip	Tiburón oceánico	*Carcharhinus longimanus*	*0.094*	*0.622*	**5**	**7**
LMA	Longfin mako	Marrajo carite	*Isurus paucus*	*0.018*	*0.583*	**6**	**3**
BSH	Blue shark	Tiburón azul - Tintorera	*Prionace glauca*	*0.286*	*0.514*	**7**	**12**
SPZ	Smooth hammerhead	Tiburón martillo	*Sphyrna zygaena*	*0.11*	*0.324*	**8**	**9**
SPL	Scalloped hammerhead	Tiburón martillo	*Sphyrna lewini*	*0.105*	*0.218*	**9**	**8**
POR	Porbeagle	Marrajo sardinero	*Lamna nasus*	*0.048*	*0.149*	**10**	**4**
PST	Pelagic stingray	Raya	*Pteroplatytrygon violacea*	*0.153*	*0.058*	**11**	**11**
ALV	Common thresher	Zorro común	*Alopias vulpinus*	*0.133*	*0.023*	**12**	**10**

Productivity, susceptibility and vulnerability rank estimated for 11 species of pelagic elasmobranchs.

Cortés, E., Arocha, F., Beerkircher, L., Carvalho, F., Domingo, A., Heupel, M., Holtzhausen, H., Neves, M., Ribera, M. and Simpfendorfer, C. 2010, Ecological Risk Assessment of pelagic sharks caught in Atlantic pelagic longline fisheries. Aquat. Living Resour. Vol. 23, no. 1, pp. 25-34.

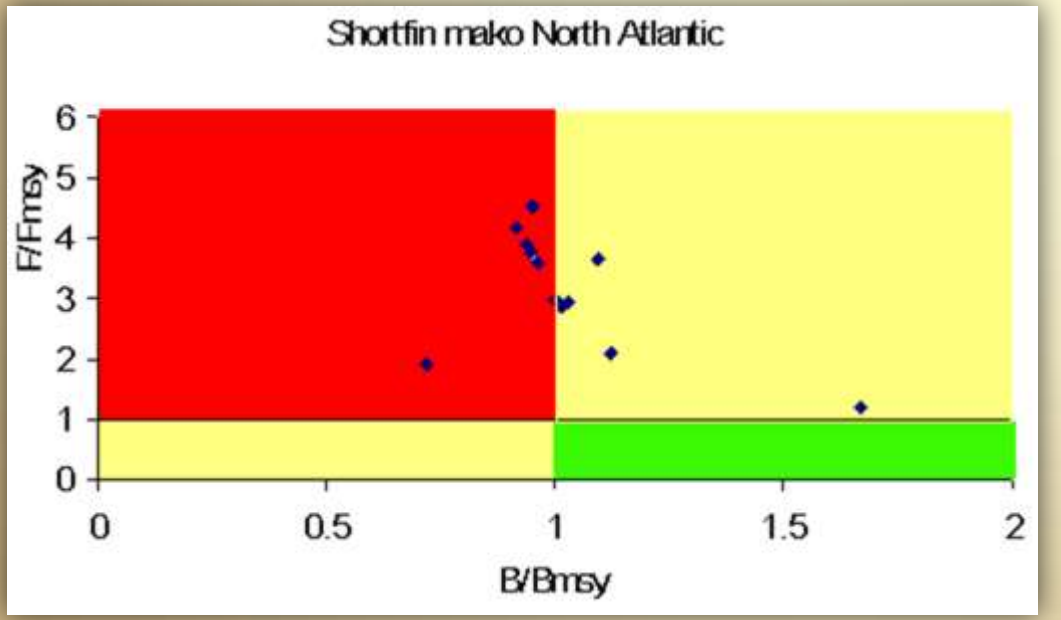
Blue shark		North	South
2007 Yield		61,845	37,075
Provisional Yield (2010)		37,238	27,729
Relative Biomass	B_{2007}/B_{MSY}	1.87-2.74	1.95-2.80
	B_{2007}/B_0	0.67-0.93	0.86-0.98
Relative Fishing mortality	F_{MSY}	0.15	0.15-0.20
	F_{2007}/F_{MSY}	0.13-0.17	0.04-0.09

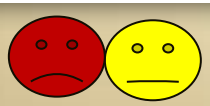


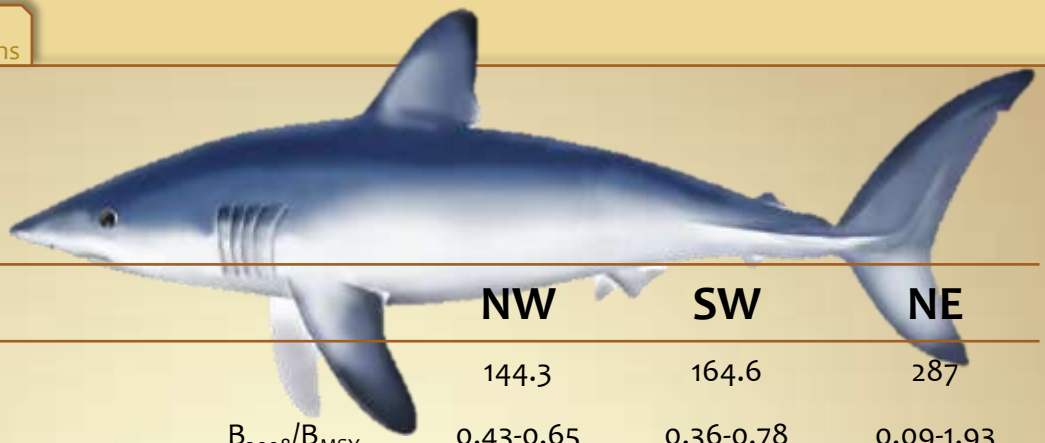


North Atlantic shortfin mako shark

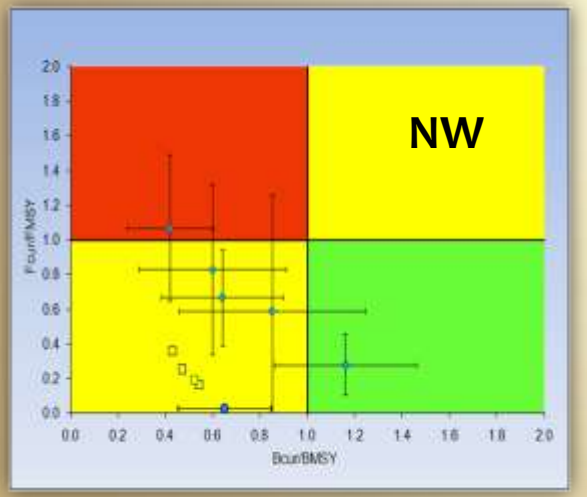
2007 Yield		5,996
Provisional Yield (2010)		4,016
Relative Biomass	B_{2007}/B_{MSY}	0.95-1.65
	B_{2007}/B_0	0.47-0.73
Relative Fishing mortality	F_{MSY}	0.007-0.05
	F_{2007}/F_{MSY}	0.48-3.77

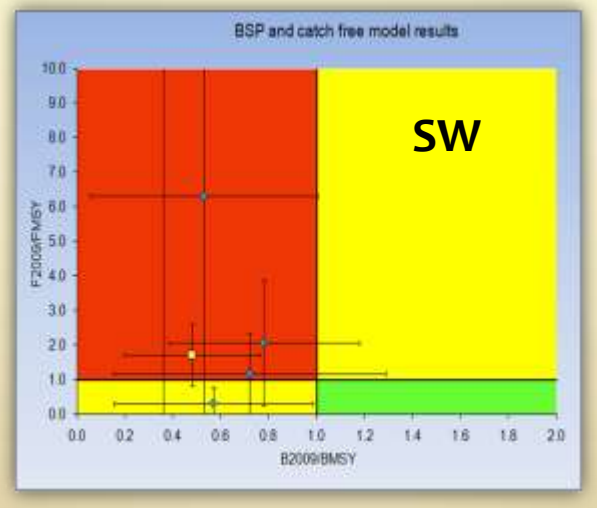


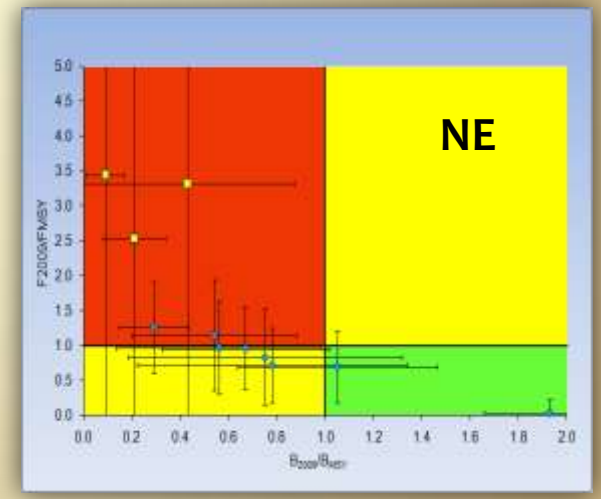




Porbeagle		NW	SW	NE
2008 Yield		144.3	164.6	287
Relative Biomass	B_{2008}/B_{MSY}	0.43-0.65	0.36-0.78	0.09-1.93
Relative Fishing mortality	F_{MSY}	0.025-0.075	0.025-0.033	0.02-0.03
	F_{2008}/F_{MSY}	0.03-0.36	0.31-10.78	0.04-3.45
Management measures in effect		TAC 185, 11.3	None	FL > 210cm







Management recommendations

- **Precautionary management measures** should be considered for stocks where there is the **greatest biological vulnerability** and conservation concern, and for which there are **very few data.**

- Management measures should ideally be **species-specific** whenever possible.

- For species of **high concern** (in terms of overfishing), and for which a **high survivorship** is expected in fishing gears after release, the Committee recommends that the Commission **prohibit retention and landing** of the species to minimize fishing mortality.

Management recommendations

- **Look-alike species** may complicate compliance with management measures. To minimize this to the degree possible, **advances in data collection, research on life history, and on interactions with tuna fisheries, need be made**.

- Until such information is available, the Commission should consider taking **effective measures to reduce the fishing mortality** of these stocks. These measures may include:
  - minimum or maximum **size limits** for landing (for protection of juveniles or the breeding stock, respectively);

  - any other technical **mitigation measures** such as gear modifications, time-area restrictions, or others, as appropriate, provided they are tested for effectiveness through research projects before they are implemented. This is needed to minimize by-catch for all sharks of concern and especially porbeagle.

Management recommendations

- The **SCRS welcomed the measures adopted by the COM** in the past two years regarding the species ranked as the most vulnerable in the ERA and for which almost no data have been submitted (bigeye thresher, oceanic whitetip shark and hammerhead shark).
- The SCRS recommended that similar conservation and management measures be also adopted for the **silky shark** (*Carcharhinus falciformis*). .

Code	Species (Eng)	Species (Spa)	Species (sci)	Vuln. Rank	
FAL	Silky shark	Tiburón jaquetón	*Carcharhinus falciformis*	1	
SMA	Shortfin mako	Marrajo dientuso	*Isurus oxyrinchus*	2	✘
				3	
BTH	Bigeye thresher	Zorro ojón	*Alopias superciliosus*	4	✘
OCS	Oceanic whitetip	Tiburón oceánico	*Carcharhinus longimanus*	5	✘
LMA	Longfin mako	Marrajo carite	*Isurus paucus*	6	
BSH	Blue shark	Tiburón azul - Tintorera	*Prionace glauca*	7	
SPZ	Smooth hammerhead	Tiburón martillo	*Sphyrna zygaena*	8	✘
SPL	Scalloped hammerhead	Tiburón martillo	*Sphyrna lewini*	9	✘
POR	Porbeagle	Marrajo sardinero	*Lamna nasus*	10	
PST	Pelagic stingray	Raya	*Pteroplatytrygon violacea*	11	
ALV	Common thresher	Zorro común	*Alopias vulpinus*	12	

Management recommendations (Porbeagle)

- Porbeagle stocks in the NW and NE Atlantic are overfished, with the NE stock being more depleted. However, the main source of current fishing mortality is from **non-ICCAT, directed Porbeagle fisheries** that are being managed by most of the relevant Contracting Parties through quotas and other measures.

- The Commission should work with countries catching Porbeagle, particularly those with targeted fisheries, and relevant RFMOs to ensure recovery of North Atlantic Porbeagle stocks and prevent overexploitation of South Atlantic stocks.

- Porbeagle **catches should not exceed current levels**. New targeted porbeagle fisheries should be prevented, porbeagles retrieved alive should be **released alive**, and all catches should be **reported**.

- Management measures and data collection should be **harmonized among all relevant RFMOs**, and ICCAT should facilitate appropriate communication.

Management recommendations

- The Committee recommends that **joint work with the ICES Working Group on Elasmobranch Fishes** should be continued.

- The Committee recommends that scientific observers be allowed to **collect biological samples** (vertebrae, tissues, reproductive tracts, stomachs) **from species whose retention is prohibited** by current regulations.

- The Committee recommends that the CPCs explore methods to estimate catches of sharks in **purse seine and artisanal fisheries**.


Seabirds

A 3-year Process, completed in 2009

- Identify seabird species most at risk
- Collate available data on at-sea distribution of these species;
- Analyze the spatial and temporal overlap between species distribution and ICCAT longline fishing effort
- Review existing by-catch rate estimates for ICCAT longline fisheries
- Estimate total annual seabird by-catch

Conclusions

- Assessments conducted indicate that **ICCAT fisheries have measurable impacts on populations of seabirds** which can be found in the Convention area, including some species of seabirds that are threatened with extinction.

- Assessments conducted also indicate that **minimizing seabird mortality** due to ICCAT fisheries can result in **improvement in future seabird population status**, potentially leading to lessened conservation concerns for those populations, in some cases.

- Lessons from ICCAT areas where seabird by-catch was formerly high but has been reduced show clearly that **there is no single measure that can effectively reduce seabird by-catch**. It is important to employ, simultaneously, a suite of measures.

Conclusions

- ICCAT should, at a minimum, require **use of tori lines in combination with at least one other effective mitigation measure** throughout the Convention area, until it can be demonstrated through direct observation, that by-catch levels are of insignificant magnitude for seabird populations.

Combination of:
- Tori-lines
- Line weighting
- Night Setting

Responses to Commission's requests

- 18.1 Develop a Limit Reference Point (LRP) for the North Atlantic swordfish stock [Rec. 10-02]
- 18.2 Review of North Atlantic swordfish data requested under [Rec. 10-02]
- 18.5 Completing the sharks identification guide [Rec. 10-06]
- 18.8 Response to the Commission regarding by-catch of sea turtles in ICCAT fisheries [Rec. 10-09]

18.1 Develop a Limit Reference Point (LRP) for the North Atlantic swordfish stock [Rec. 10-02]

- [Rec. 10-02] requests the SCRS to develop a Limit Reference Point (LRP) for the North Atlantic swordfish stock in advance of the next assessment. On the basis of the LRP established by the Committee, future decisions on management shall include a measure that would trigger a rebuilding plan, should the biomass decrease to a level approaching the defined LRP.

- 2 approaches:

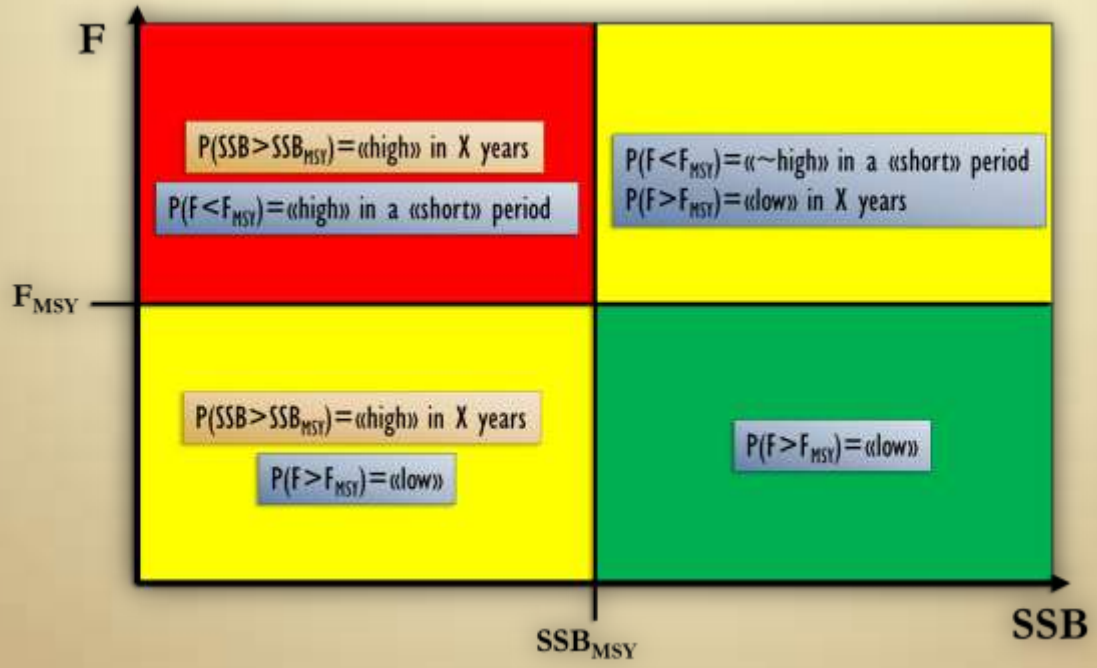
  - An updated framework model for **evaluation of biomass based LRPs** (review **SCRS/2009/029**). The objective was to determine the variability on biomass due to the particular biological characteristics of the stock (eg., S-R relationship).

  - **SCRS/2011/195** describes a simulation framework that will allow the **evaluation of the performance** (i.e., how well management objectives are met) **of the candidate LRPs**, and their robustness to uncertainty.

18.1 Develop a Limit Reference Point (LRP) for the North Atlantic swordfish stock [Rec. 10-02]

- The SCRS plans to continue with this work towards identifying and testing of a LRP prior to the next assessment (proposed for 2013).

- The SCRS noted that development of a LRP which increased the probability of remaining within the rebuilt condition for North Atlantic SWO would be **fully consistent with the principles of decision-making considered by the 2011 Working Group of the Future of ICCAT.**



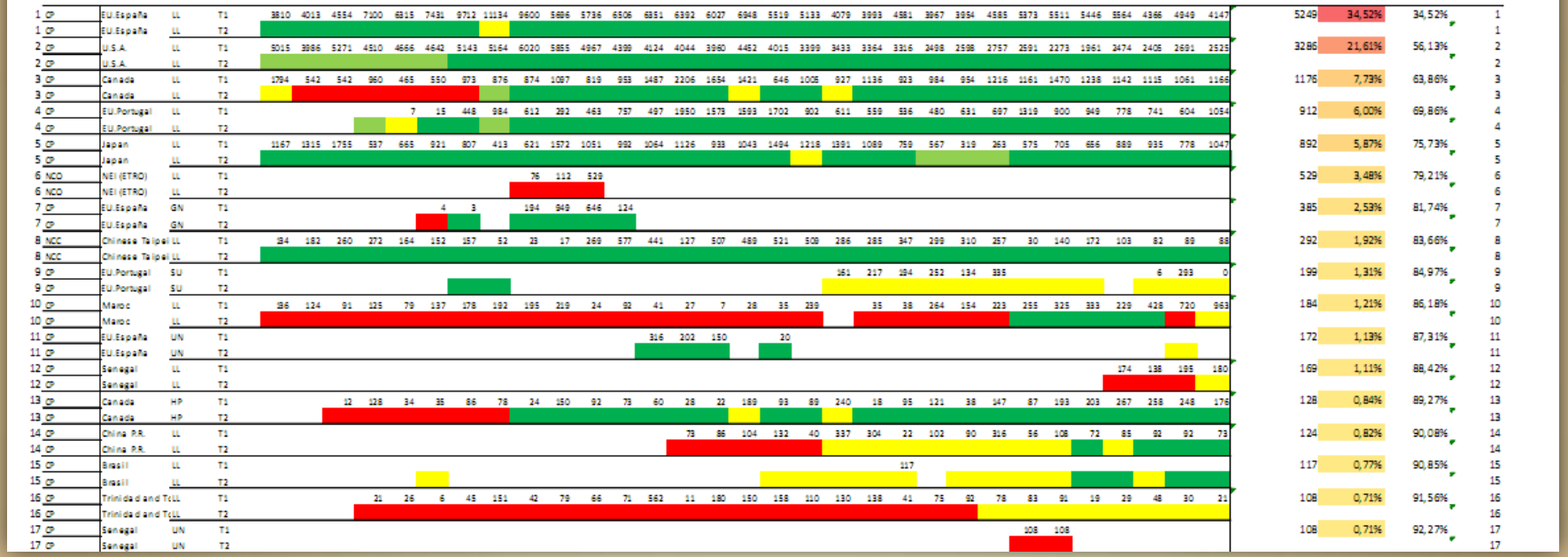
18.2 Review of North Atlantic swordfish data requested under [Rec. 10-02]

- [Rec. 10-02] calls for the SCRS to provide an evaluation of the best available data submitted by all CPCs. Those data should include catch, catch at size, location and month of capture on the smallest scale possible, as determined by the SCRS. The data submitted shall be for broadest range of age classes possible, consistent with minimum size restrictions, and by sex when possible. The data shall also include discards and effort statistics, even when no analytical stock assessment is scheduled.

- While **no specific responses** to this request were submitted by CPCs, the SCRS tabulated the **information currently available to the SCRS for stock assessment purposes** (see Table 2, Report of the Sub-Committee on Statistics).

18.2 Review of North Atlantic swordfish data requested under [Rec. 10-02]

Table 2. SWO-N. Catalog of northern Atlantic SWO Stock available: Task I (T1, in tonnes) and Task II (T2 availability; yellow= t2-CE only; light green= t2-SZ only; dark green= T2-CE + SZ) statistics, between 1980 and 2010. For t2sz, either size frequencies and CAS were considered.



- The summary indicates **an improving trend** in the availability of catch and effort information, but provides **no indication of the quality or completeness** of the available data.
- Over the recent past (2000-2010), CPCs providing **information on dead discards** include USA, Canada and Japan for the North Atlantic stock.

18.5 Completing the sharks identification guide [Rec. 10-06]

- The **second part of the identification sheets for Atlantic shark species** was presented to the Committee. The new guide is pending final revision and will be **available** in the three official ICCAT languages at the COM meeting.

18.8 Response to the Commission regarding by-catch of sea turtles in ICCAT fisheries [Rec. 10-09]

- The SCECO met and reviewed **progress toward meeting the data submission** requirements outlined in Rec.10-09.
- The SCECO reviewed **5 working papers and 2 presentations** addressing turtle by-catch in the Convention area.
- **Factors were identified** contributing to the number of encounters along with effective mitigation measures.
- A **Sea Turtle Expert** (short-contract 6 months, starting in the first quarter of 2012)
  - will elaborate a **database** containing the information needed to conduct the impact assessment;
  - will **coordinate** efforts to identify and contact national scientists with expertise in sea turtles, by-catch estimation procedures or analytical techniques used to conduct impact assessments on by-catch species.

18.8 Response to the Commission regarding by-catch of sea turtles in ICCAT fisheries [Rec. 10-09]

- During 2012, the Sea Turtle Expert, in cooperation with the Sub-Committee on Ecosystems and the Secretariat, will **identify and compile** the following:
  - 1. Sea turtle by-catch data sources
  - 2. Gaps in knowledge
  - 3. Methodologies used to extrapolate total by-catch using data from the reporting fleets
  - 4. Methods to estimate post-release mortality.
  - 5. Impact assessment methodologies that may appropriate to implement given the available data.

- The Sub-Committee will meet **in 2012** to review this information and make recommendations with regard to the utility of the methodologies described in items 3-5. National scientists identified by the CPCs and selected by the Sea Turtle Expert as possessing expertise in these methodologies will be encouraged to attend.

P4 Research and Statistics

General recommendations to the Commission that have financial implications

- The Committee noted that the **By-catch Coordinator position** remains unfilled and strongly recommends that this position be recruited promptly.

General recommendations to the Commission that have financial implications

- The Committee recommends the establishment of an **ICCAT Year Research Programme for small tuna** species (SMTYP).
- Main initial objective: **collection of statistics and biological data** as well as the recovery of all the historical available data in the main fishing areas.
- Initial duration: **2012-2013** (**95,000 €**)

Sampling area	*Participating countries*	*Species sampled*	*Total budget (Euros)*
East Mediterranean	Turkey Egypt	Bullet tuna, Atlantic bonito, Little tunny and Plain Bonito;	15 000,00
Central Mediterranean	Tunisia Italy	Bullet tuna, Atlantic bonito, Little tunny and Plain Bonito;	15 000,00
West Mediterranean	Morocco Spain	Bullet tuna, Atlantic bonito, Little tunny and Plain Bonito	15 000,00
West Africa	Morocco Mauritania Senegal Cape Vert Côte d'Ivoire	Atlantic bonito, Little tunny, Bullet tuna and West African Spanish mackerel; Frigate tuna, wahoo	35 000,00
Caribbean area (western Atlantic)	CARICOM countries Brazil Venezuela	Blackfin tuna and Serra Spanish mackerel	15 000,00
Total			95 000,00

General recommendations to the Commission that have financial implications

- Noting the misidentification problems between white marlin, roundscale and longbill spearfishes, the SCRS recommended conducting an **Atlantic-wide survey of WHM-RSF-SPF distribution and abundance** with the collaboration of CPCs with fleets covering the entire Atlantic, particularly in the eastern and southwestern Atlantic fishing areas.

- The Committee strongly recommended that the Commission provide **additional funding (15K Euros)** to the **Enhanced Billfish Research Program** for a **genetic study** in order to accelerate the data acquisition and analysis for separating white marlin from spearfishes to be undertaken in the immediate future.

Other recommendations

- The study on **age and growth** of BUM.
- The WHM stock assessment to be conducted in 2012 be considered as **mixed species stock assessment.**
- All CPCs, and especially those that have important catches of white marlin, provide updated **relative abundance indices** obtained from such high resolution CPUE data and also to take into consideration the **effect of current regulations in the standardization process.**
- The SCRS recommended that the **surplus production models** conducted in the **2000 WHM** stock assessment be **updated** in the 2012 stock assessment meeting.

General recommendations to the Commission that have financial implications

- The Committee recommended incorporating the description of the **six shark species** that have been included in recent Recommendations (ALV, BTH, OCS, SPL, SPZ, SPM) in Chapter 2 of the **ICCAT Manual** in the bycatch species section.

Other recommendations

- The Committee recommended that observers be allowed to collect biological samples (vertebrae, tissues, reproductive tracts, stomachs) from those species whose retention is prohibited by current regulations.

- The Committee recommended that CPCs explore methods to estimate the catches of sharks in the purse seine and artisanal fisheries.