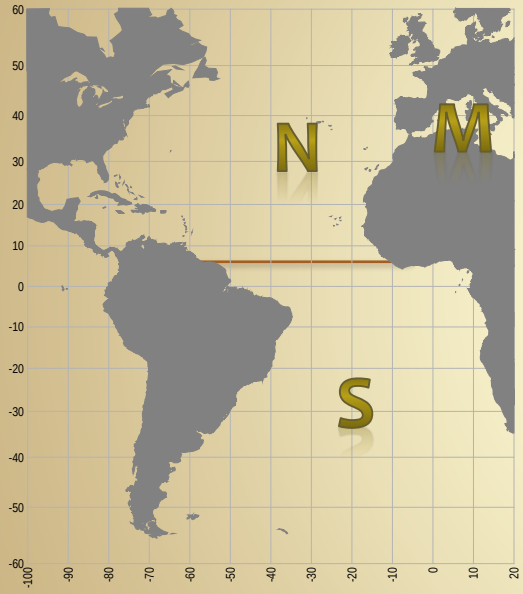
Panel 4: Other species

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

Panel 4: Items to be discussed

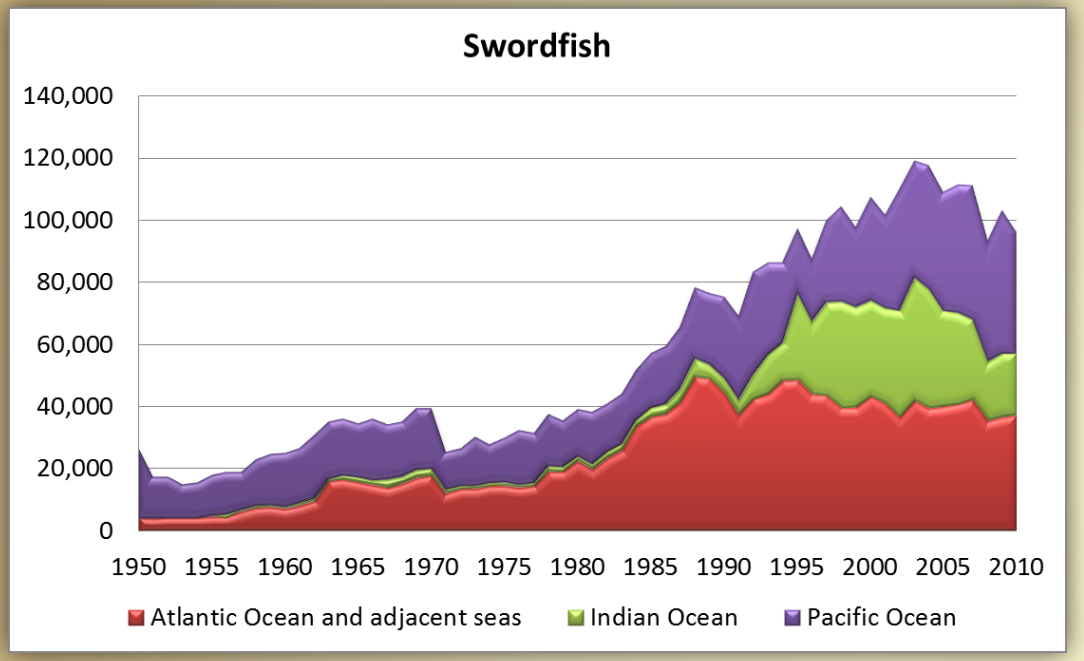
- **Swordfish**
  - North Atlantic (assessed in 2009)
  - South Atlantic (assessed in 2009)
  - Mediterranean (assessed in 2010)
- **Marlins**
  - BUM - Blue marlin (assessed in 2011)
  - **WHM – White marlin (assessed in 2012)**
- **Sailfish** (assessed in 2009)
- **Sharks**
  - **Ecological Risk Assessment (2012)**
  - Blue shark (assessed in 2008)
  - **Shortfin mako (assessed in 2012)**
  - Porbeagle (assessed in 2009)
- Responses to Commission's requests
- General recommendations to the Commission

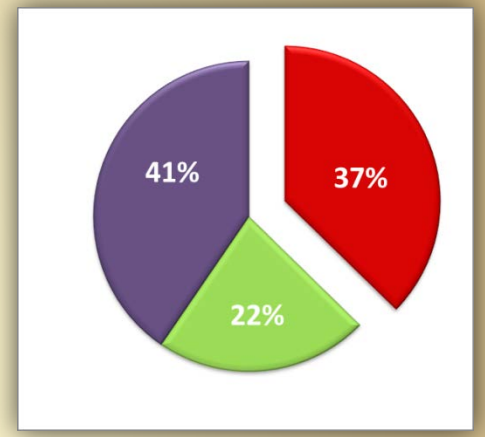
Swordfish



3 management units

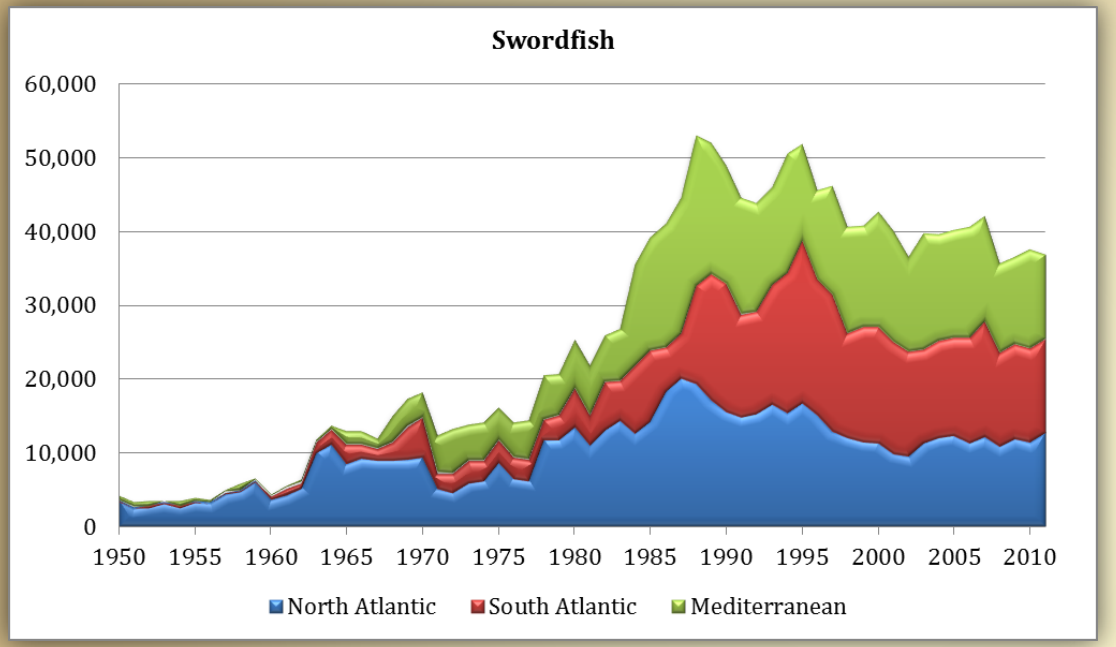
Albacore, Atún blanco, Germon	
Scientific name	*Xiphias gladius*
Distribution	Cosmopolitan species found in the tropical and temperate waters of all the oceans, between 45°N and 45°S,including the Mediterranean.
Spawning grounds	In subtropical western areas of both hemispheres and throughout the Mediterranean 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: 230 kg
Natural mortality	Assumed M=0.2

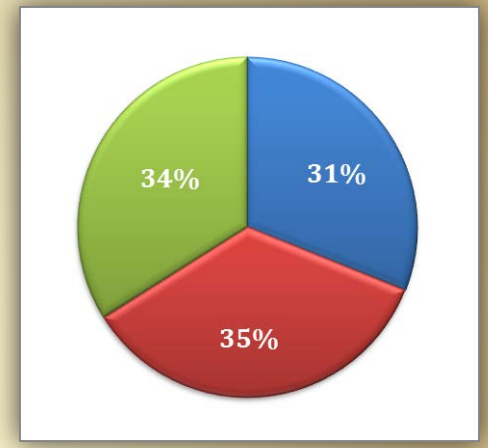




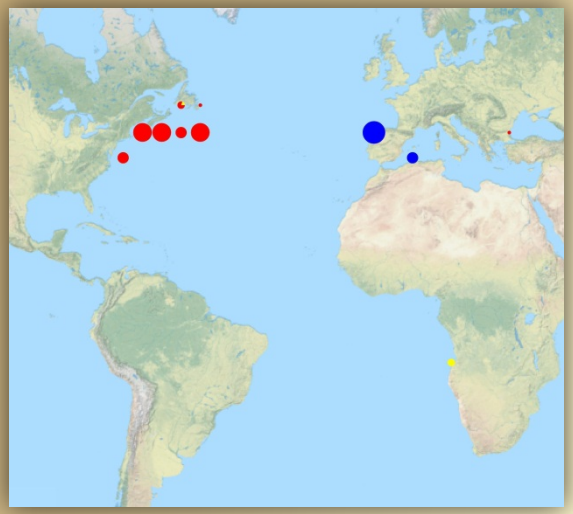
% average catch in 2006-2010

- **Atlantic** and Mediterranean SWO represents **37% of the world production** (average 2006-2010).

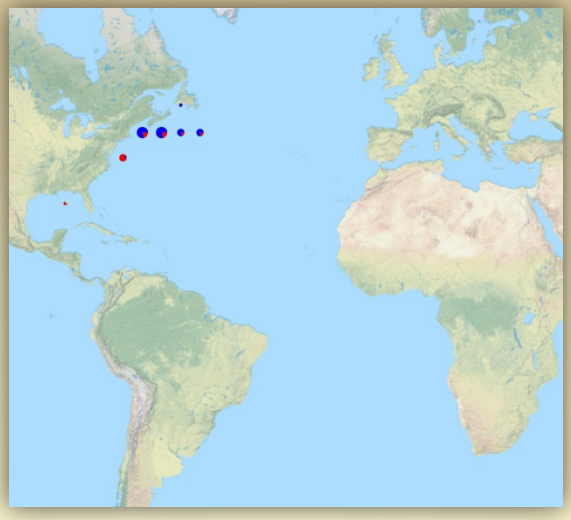




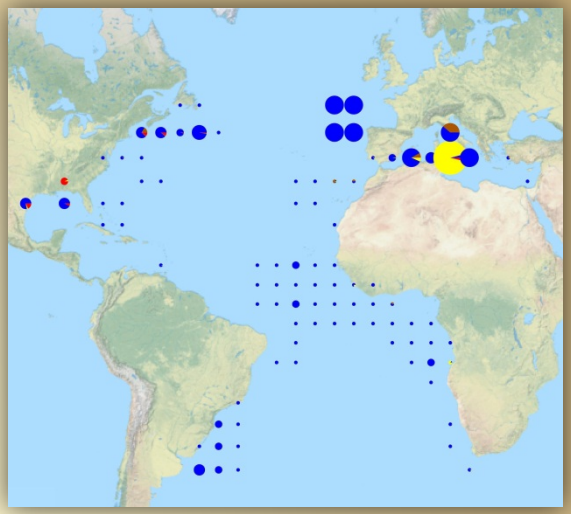
% average catch in 2006-2011



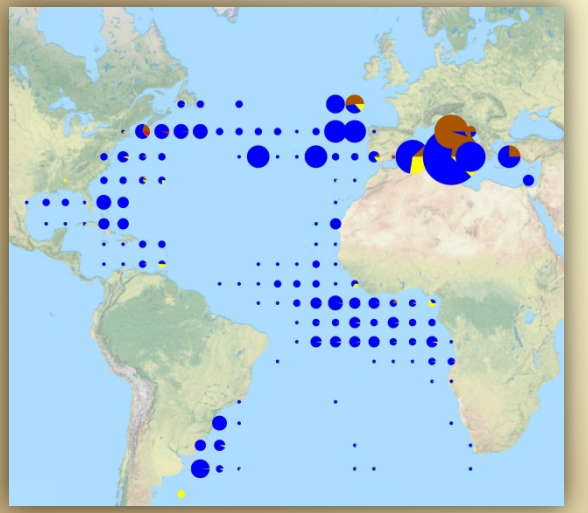
1950



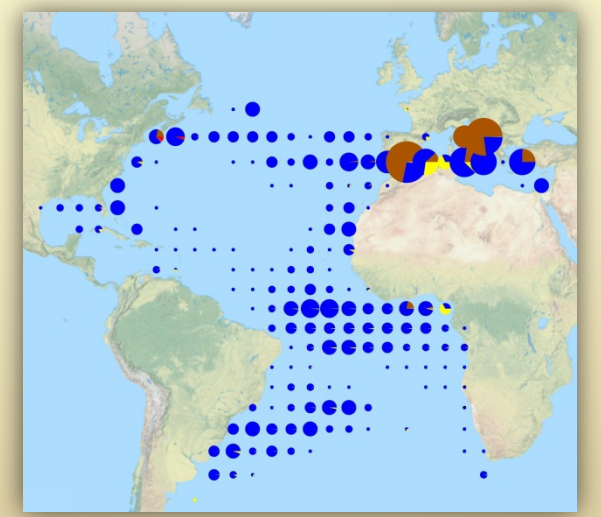
1960



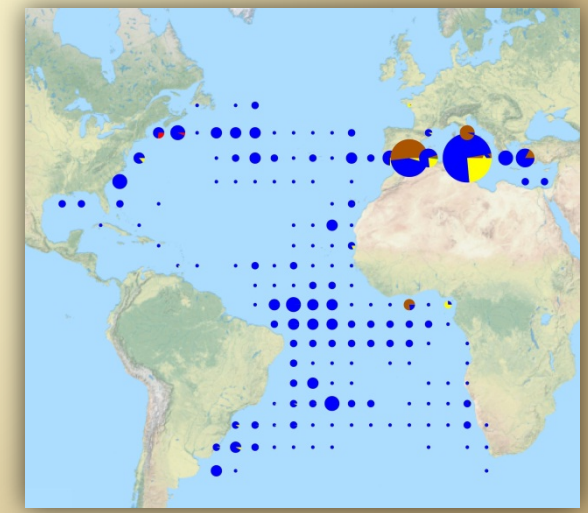
1970



1980



1990

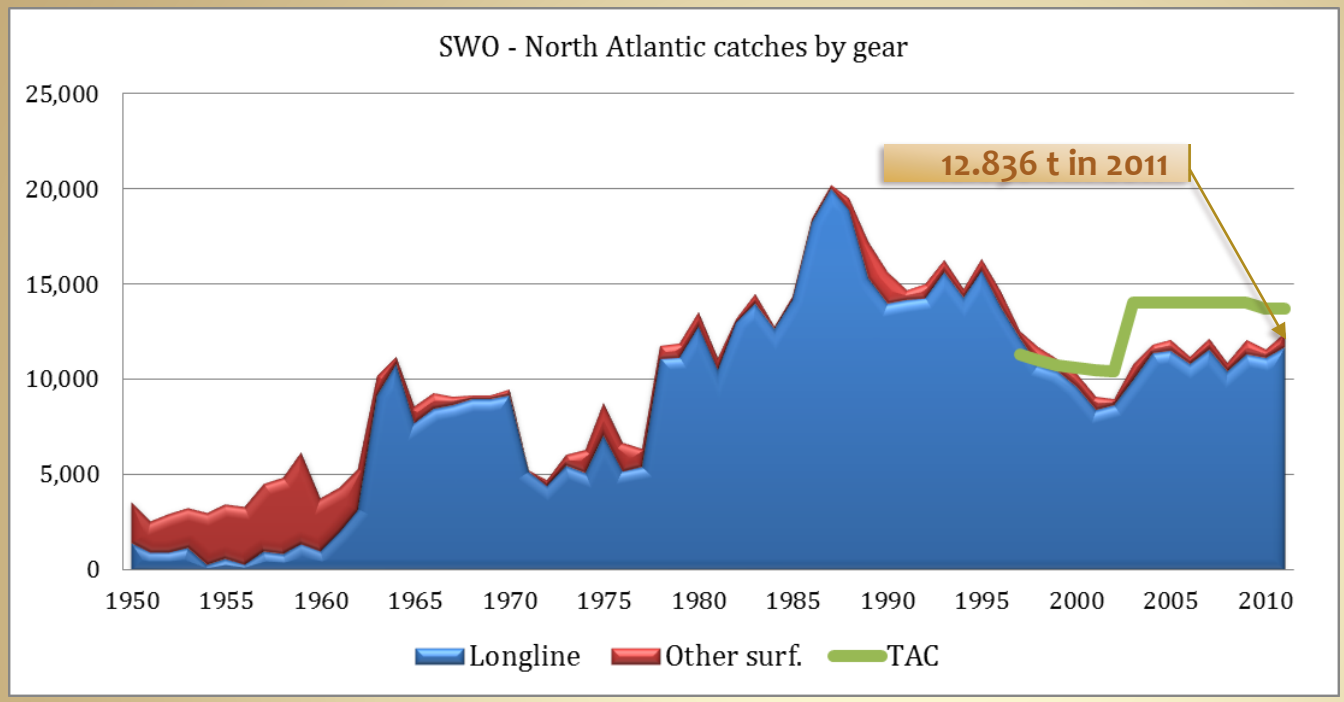


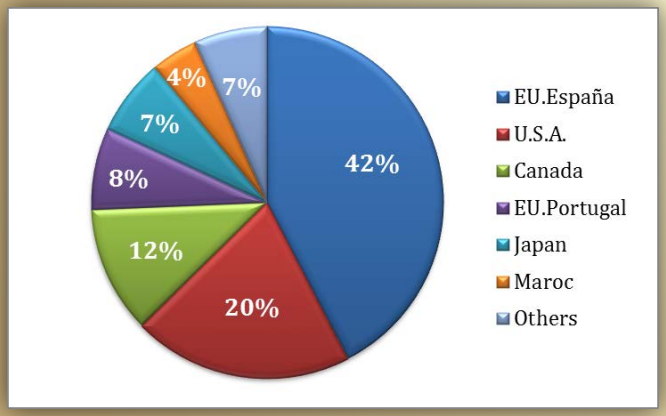
2000

Purse seine Longline Baitboat Others Gillnet Harpoon

North Atlantic swordfish

Last assessment: 2009

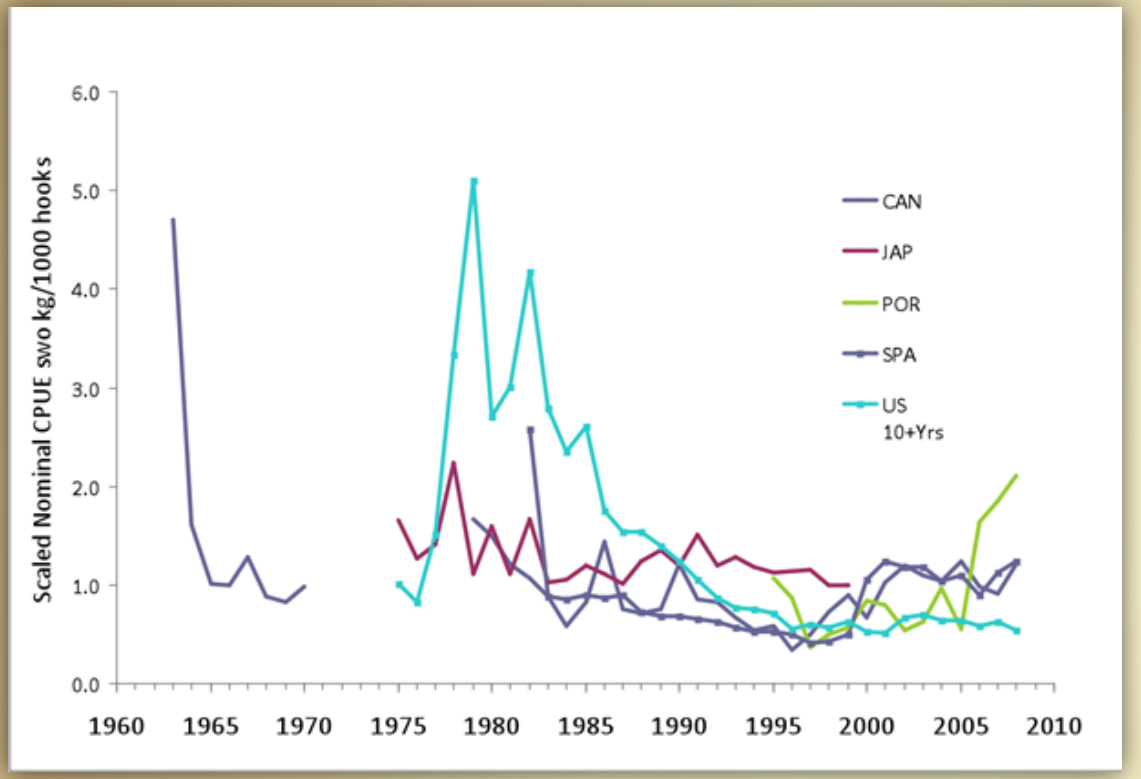




% average catch in 2005-2010

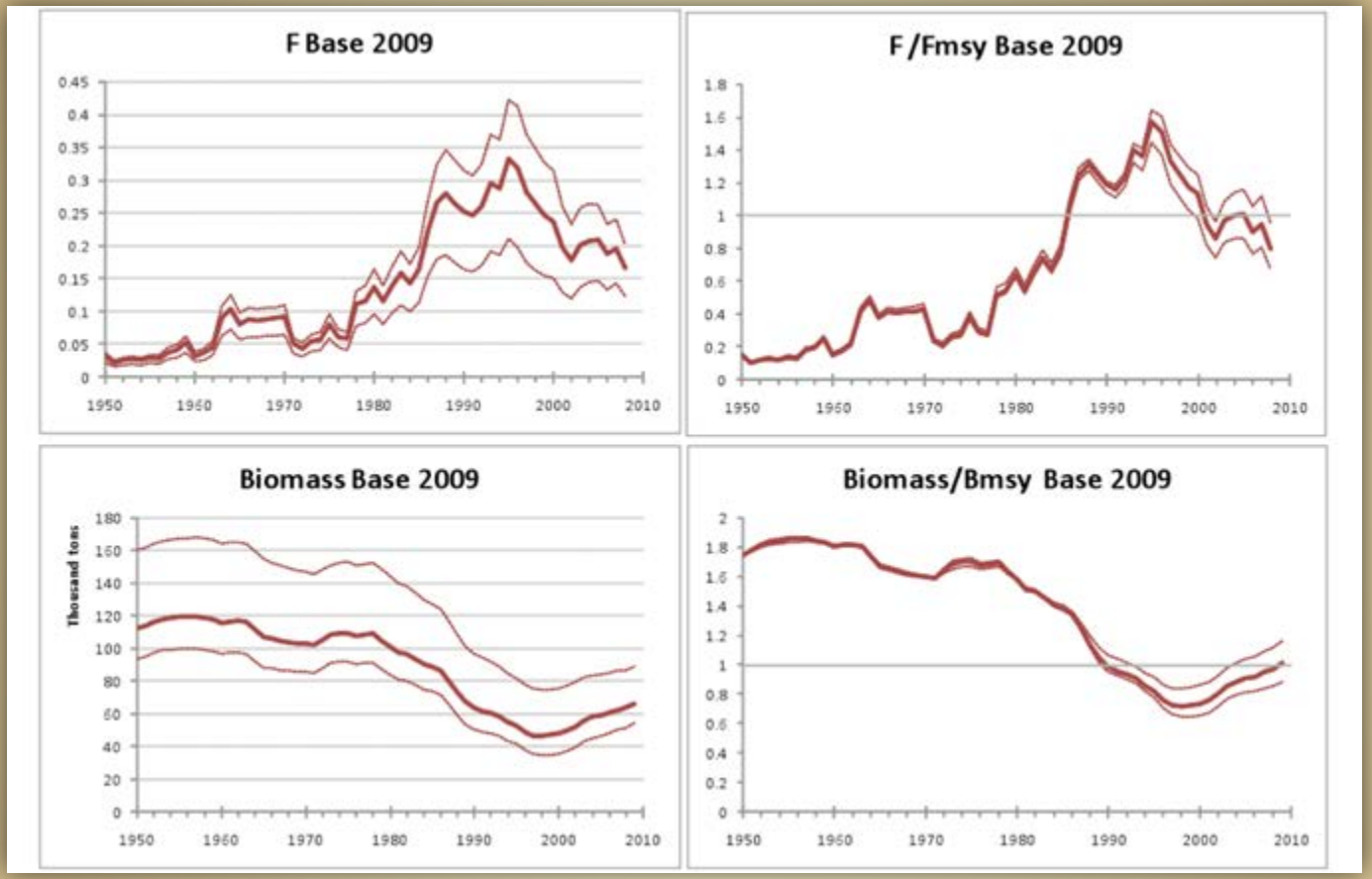
Recent catches have been less than the TAC

CPUE trends



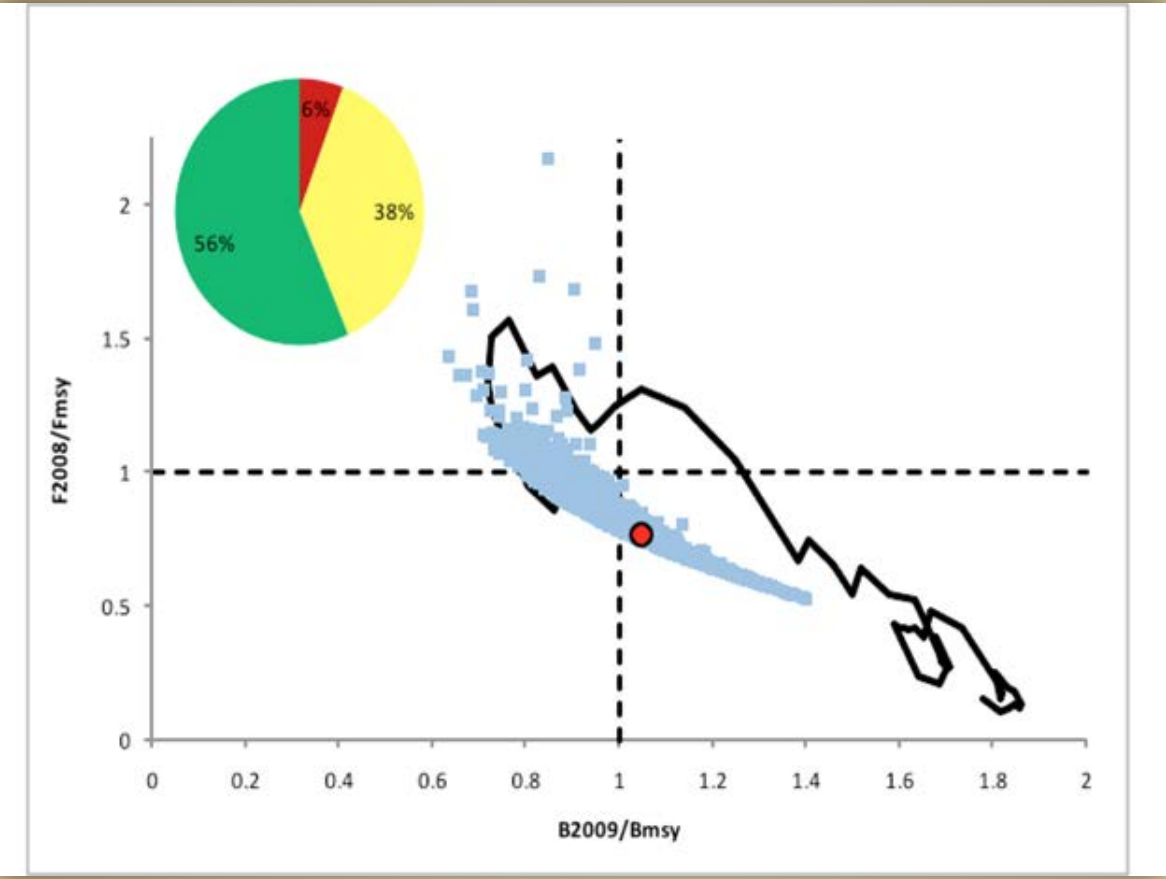
- Five nations contribute catch rates that are used in the production model.
- Most of the series have an increasing trend since the late 1990s, but the USA catch rates remained relatively flat.

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

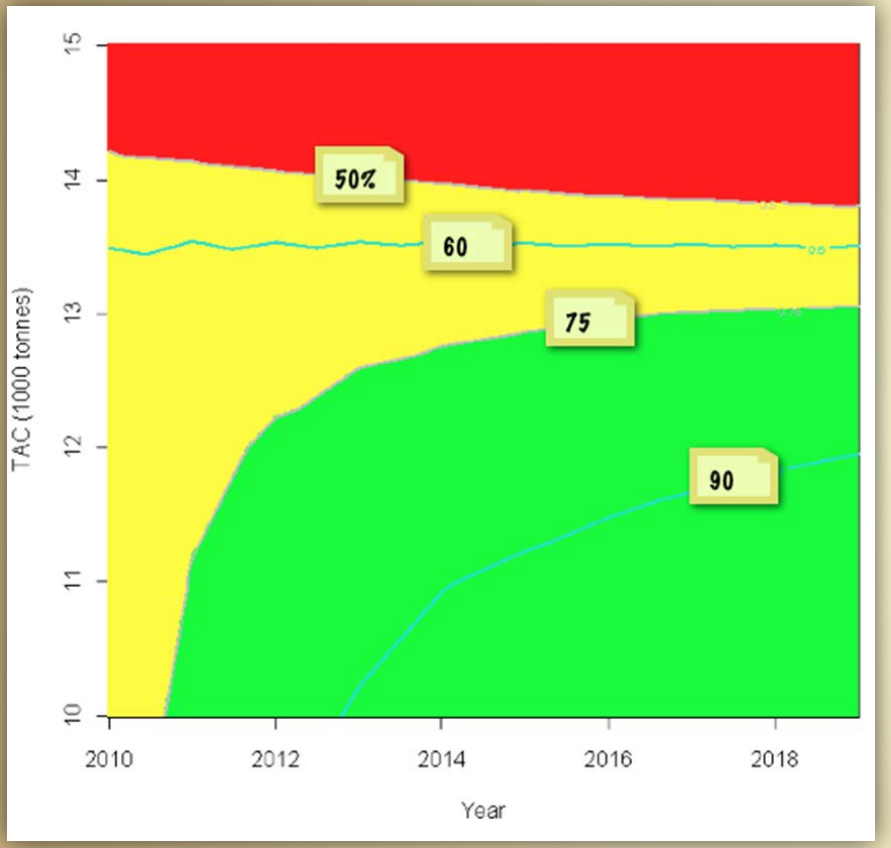


- The results suggest that there is **greater than 50% probability that the stock is at or above B_{MSY},** and thus the **Commission's rebuilding objective [99-2] has been achieved.**

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

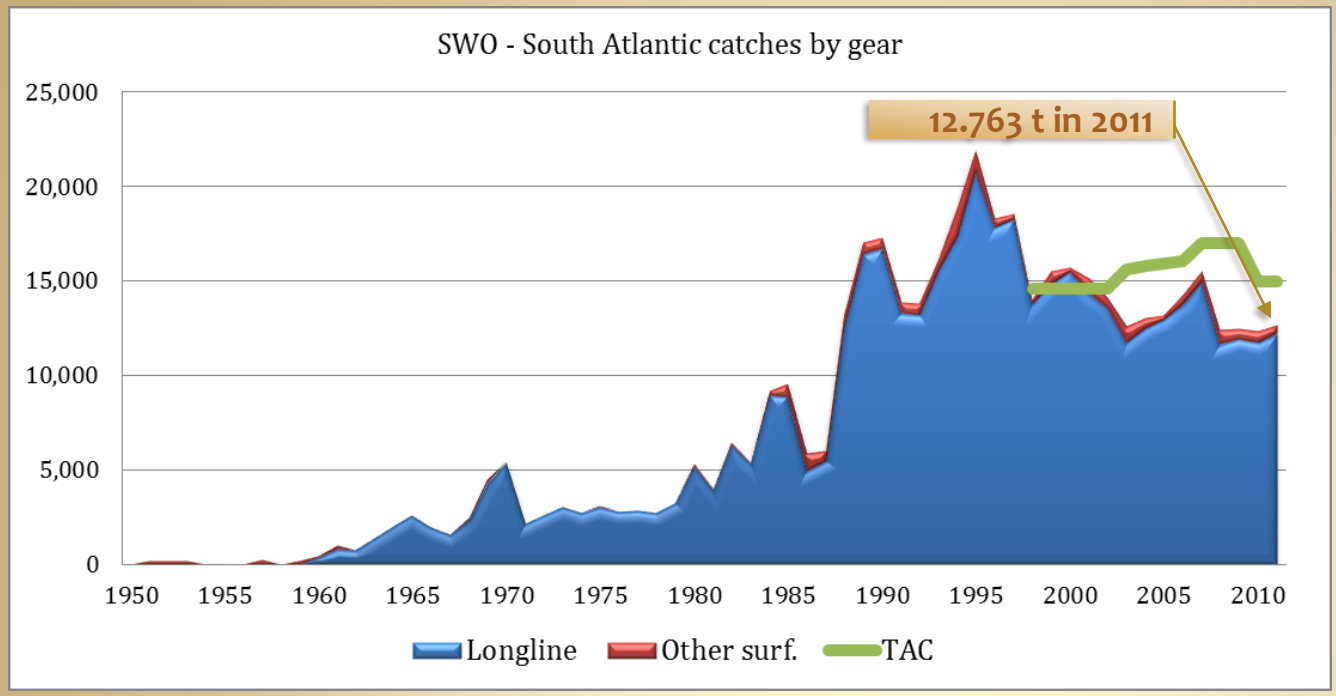


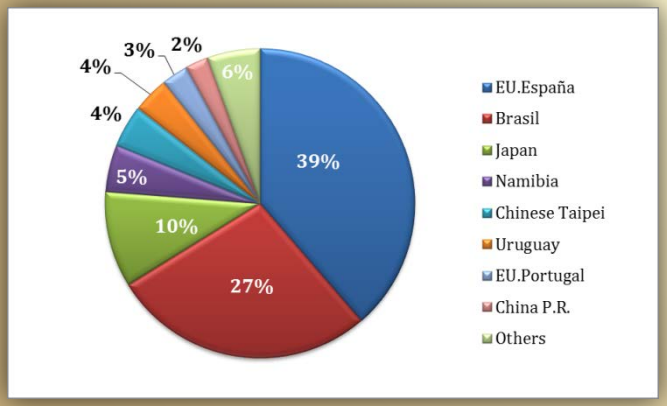
Probability contours of $B>B_{MSY}$ & $F<F_{MSY}$ for constant catch scenarios indicated over time. Red: P<50% , Yellow 50<P<75%, Green P>75%.

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

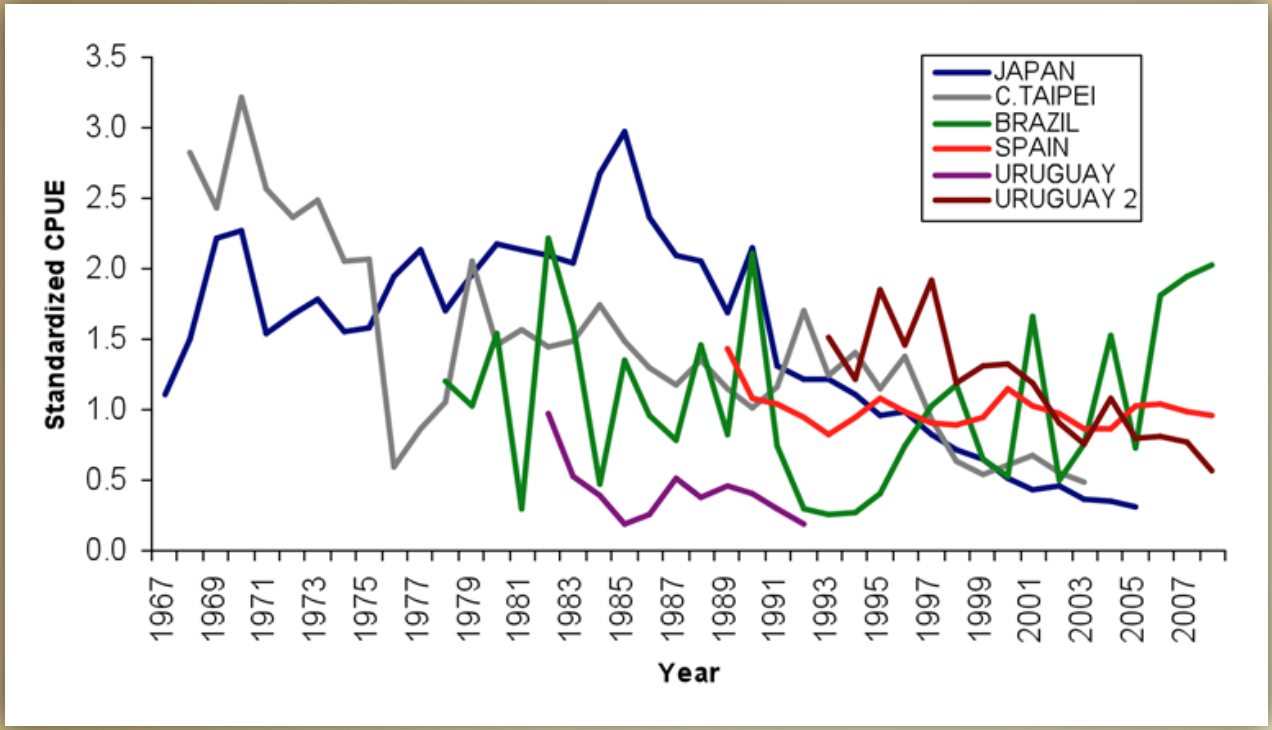




% average catch in 2005-2010

Recent catches have been less than the TAC

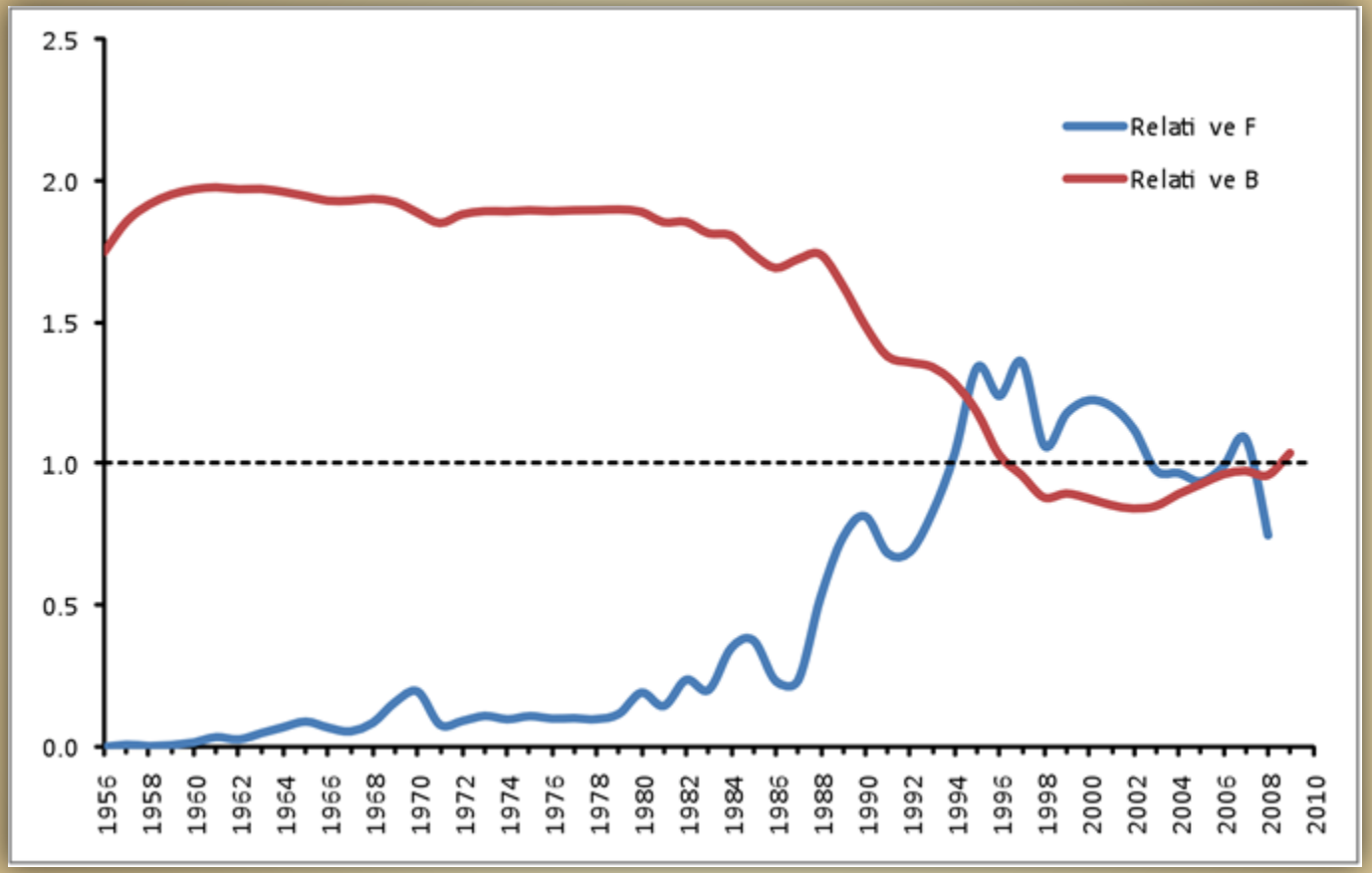
CPUE trends



- 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.

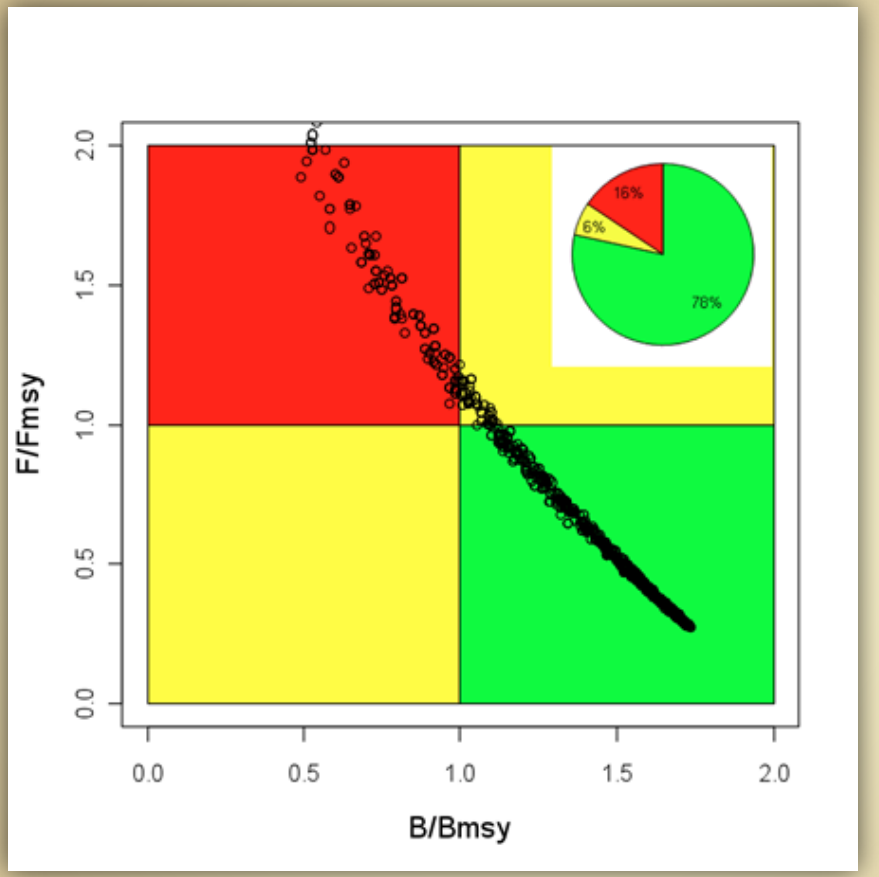
- It was noted that there was little overlap in fishing area and strategies between the by-catch and targeted fleets used for estimating CPUE pattern, and therefore the by-catch and targeted fisheries CPUE trends **could be tracking different components** of the population.

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



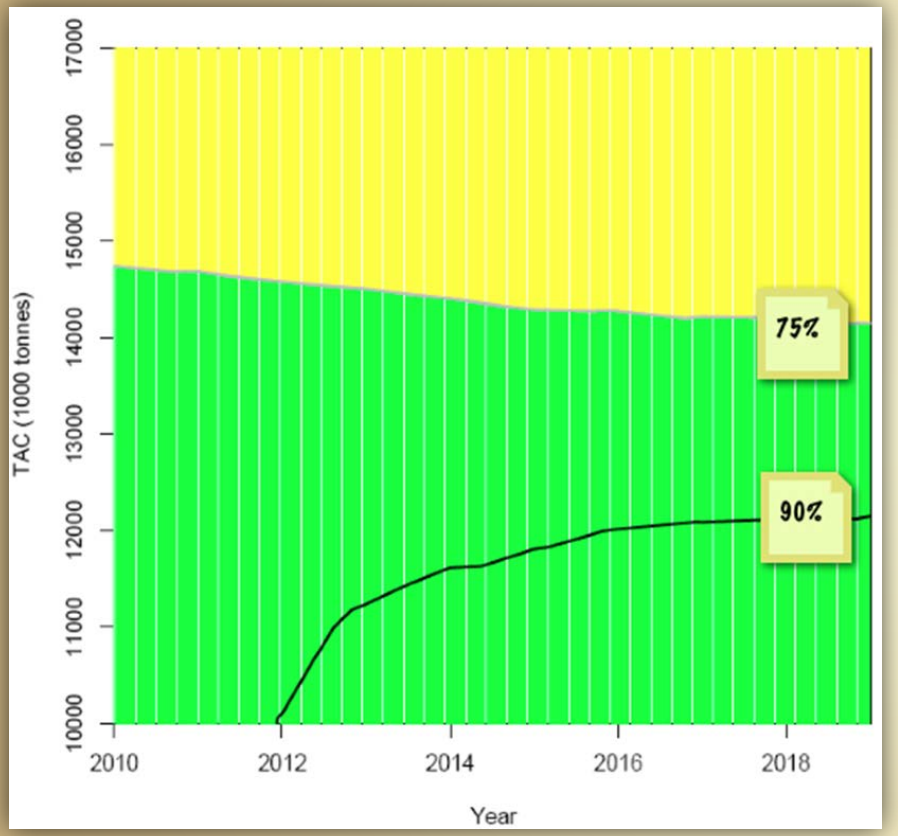
- Current estimated relative fishing mortality (F_{2008}/F_{MSY}) was 0.75 indicating that **the stock is not overexploited**. Current estimated relative biomass (B_{2009}/B_{MSY}) was 1.04.

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.

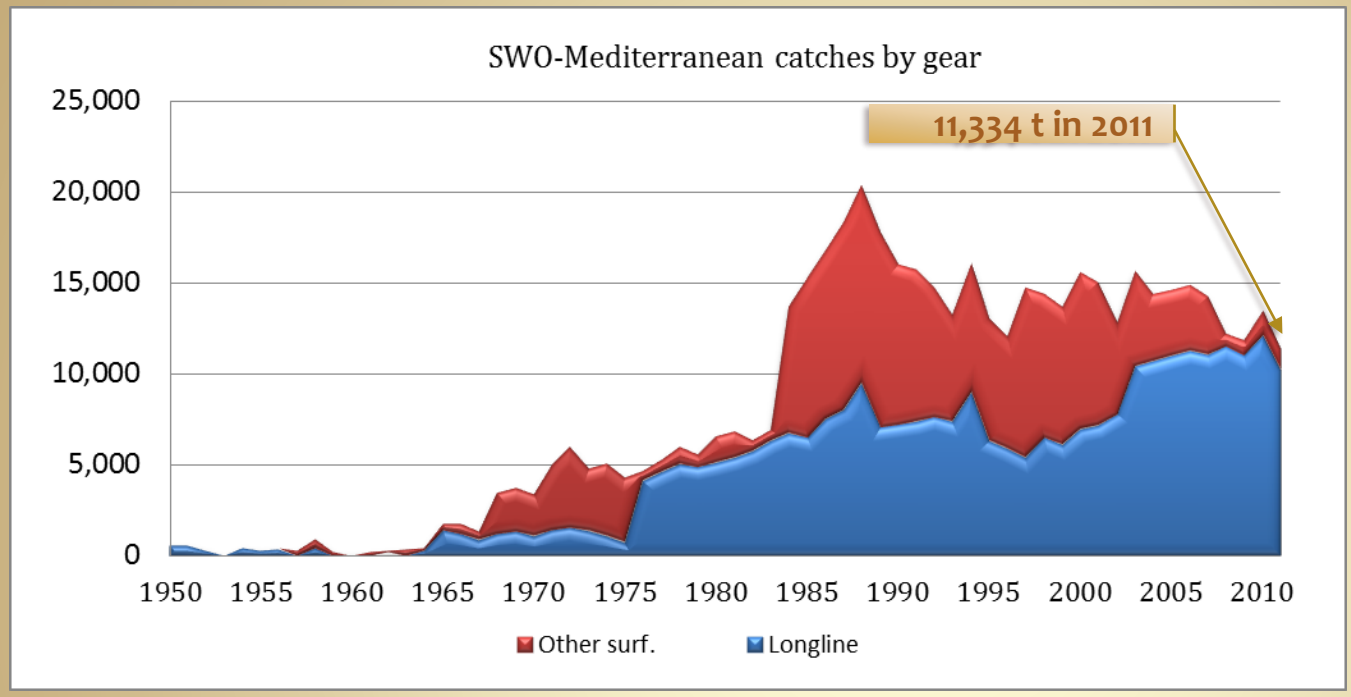
Outlook: K2SM

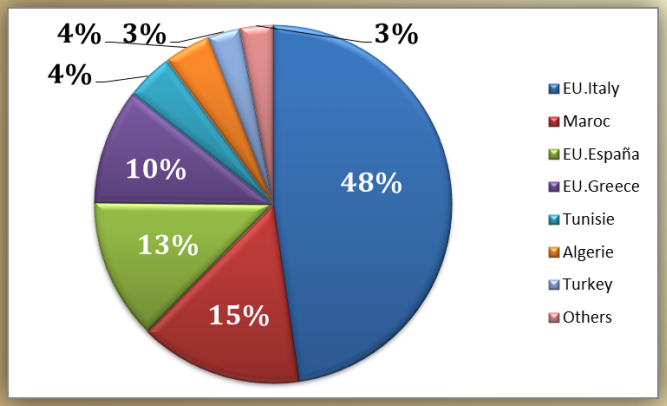


- The analysis indicated that catches on the order of **17,000t** will result in a probability of 67% of being above B_{MSY} in 10 years.
- Considering unquantified uncertainties and conflicting indications for the stock, the Committee recommends a **more precautionary approach**, limiting catches to 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

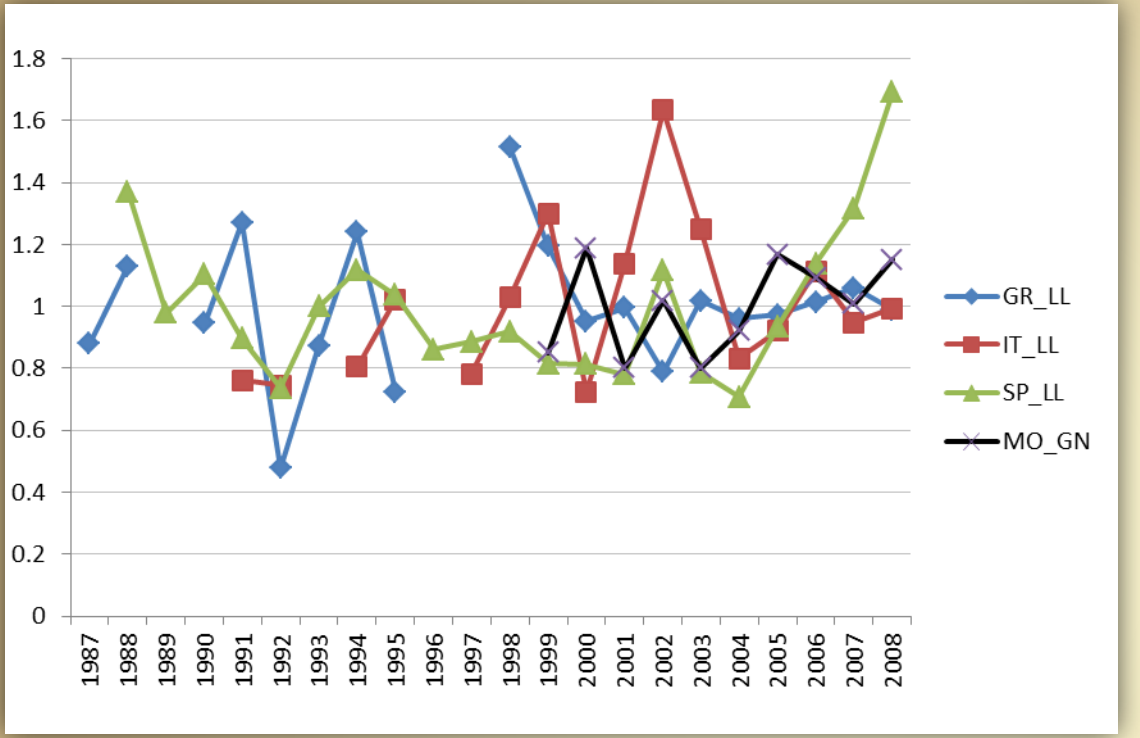




% average catch in 2005-2010

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

CPUE trends

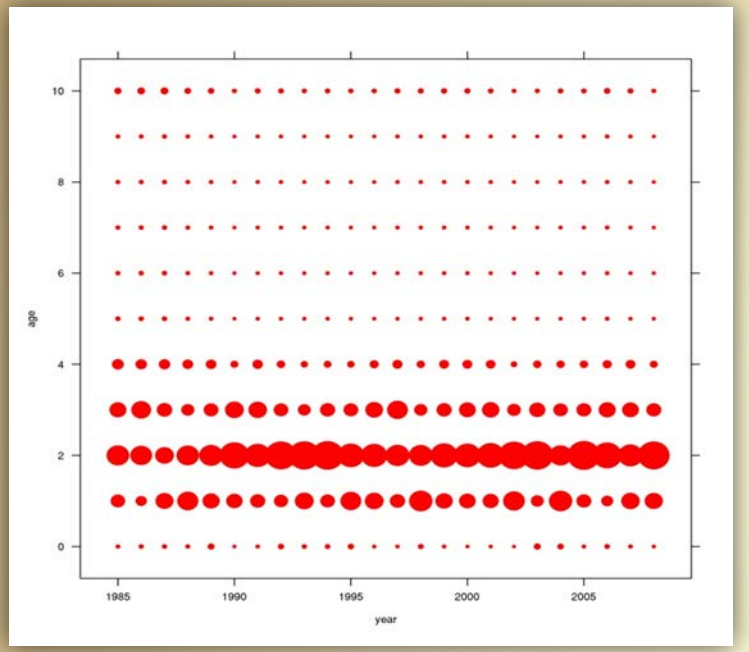


- Standardised CPUE series from the main LL and GN fisheries targeting SWO, which were presented during the 2010 stock assessment session, **did not reveal any trend over time.**

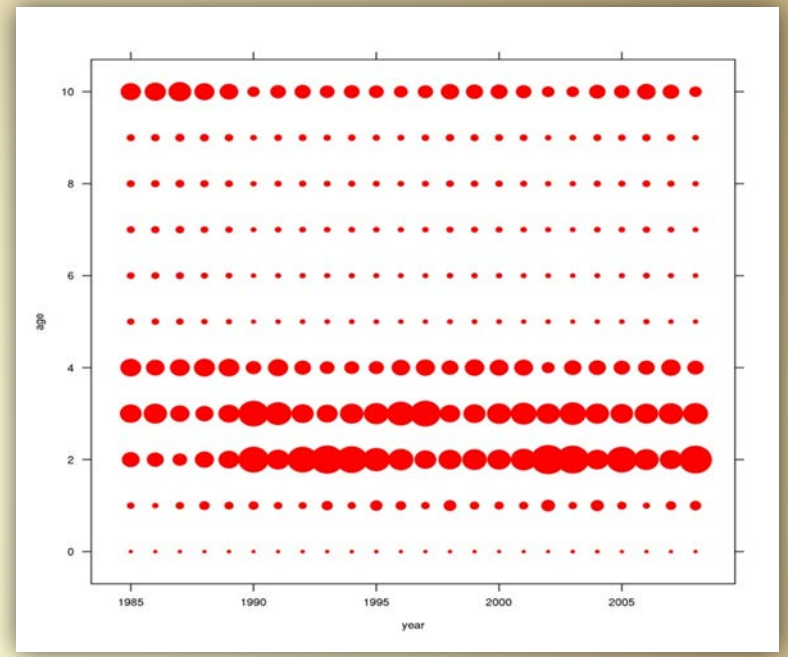
- CPUE series, however, **covered only the last 10-20 years** and not the full time period of reported landings.

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

Number

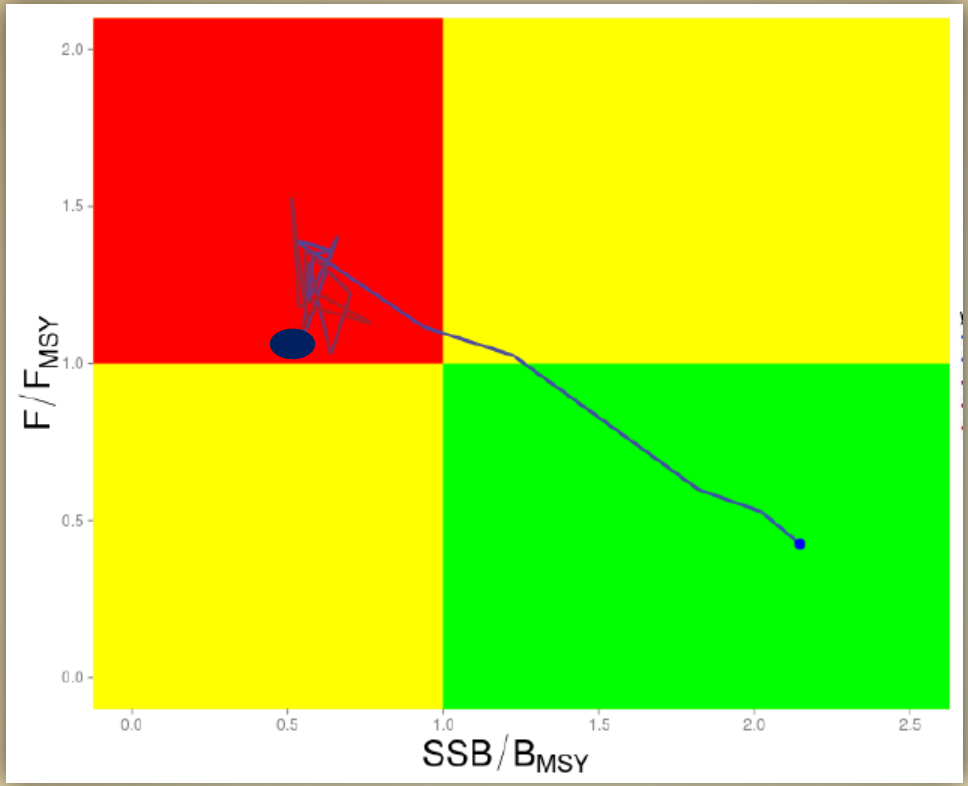


Weight



- 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



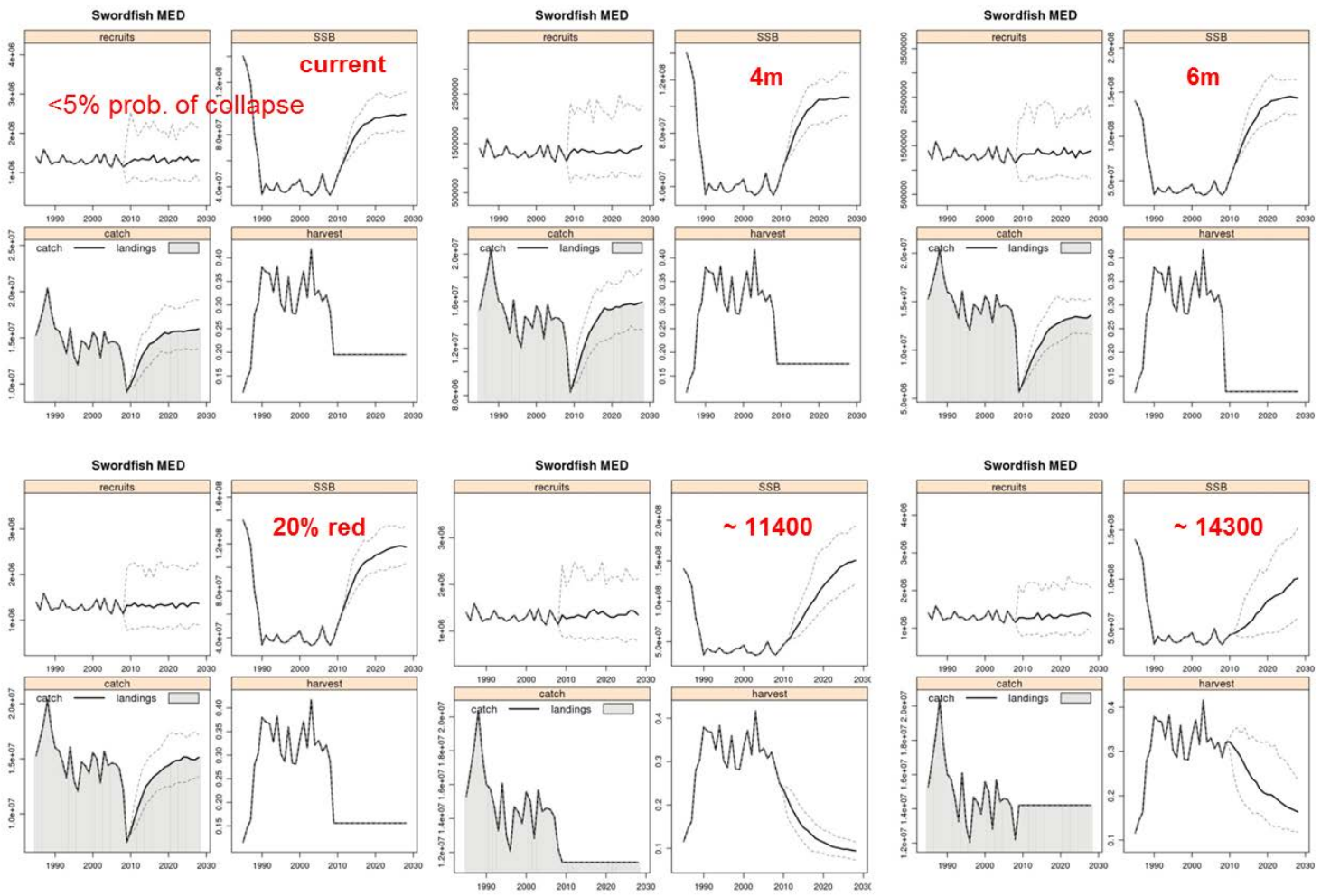
- The stock is below the level which can support MSY
- Current (2008) fishing mortality slightly exceeds F_{MSY}
- Age structured analysis indicates that current (2008) biomass levels are ~50% below B_{MSY}
- Biomass and recruitment levels stable over the last 15 years

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 previous management status (2-month closure).** A small probability (<5%) of stock collapse still exists in this case.

- 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.

Effects of current regulations

- The recently adopted [**Rec. 11-03**] (not yet fully implemented) establishes additional measures that will facilitate bringing the stock back to levels that are consistent with the ICCAT Convention objective.

- The real effect of the previously established closures was not evaluated during the 2010 assessment session due to lack of sufficient data

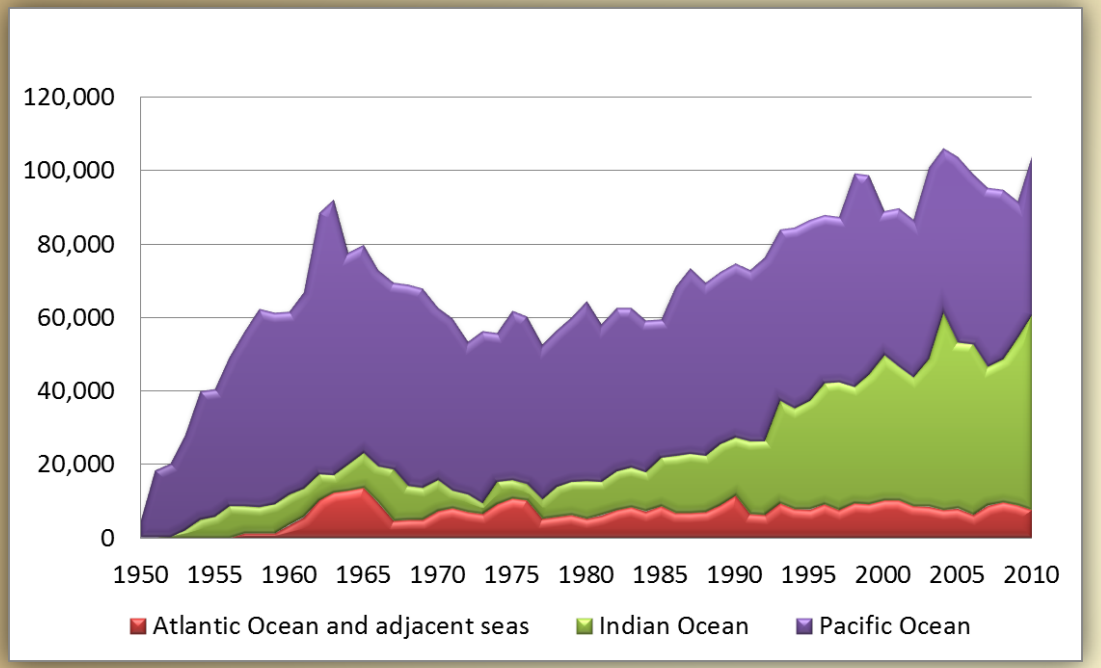
Management recommendations

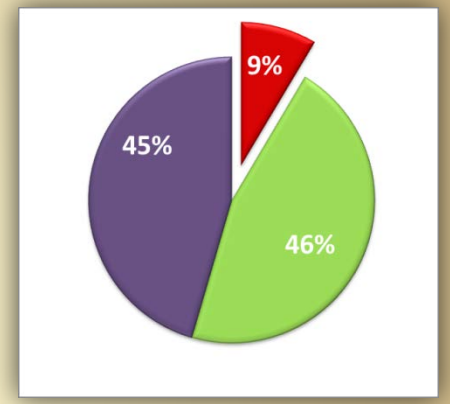
- **Capacity reductions should also be considered** as part of a Mediterranean swordfish management plan, building upon the current recommendation 11-03.

- Small **changes to [Rec. 11-03]** are needed to reproduce correctly the weight conversion factors adopted in ICCAT:

  the phrase defining the minimum landing sizes in terms of weight should be modified as follows: "*....weighing less than 10 kg of round weight or 9 kg of gilled and gutted weight, or 7.5 kg of dressed weight (gilled, gutted, fins off, part of head off)*".

Marlins





% average catch in 2005-2010

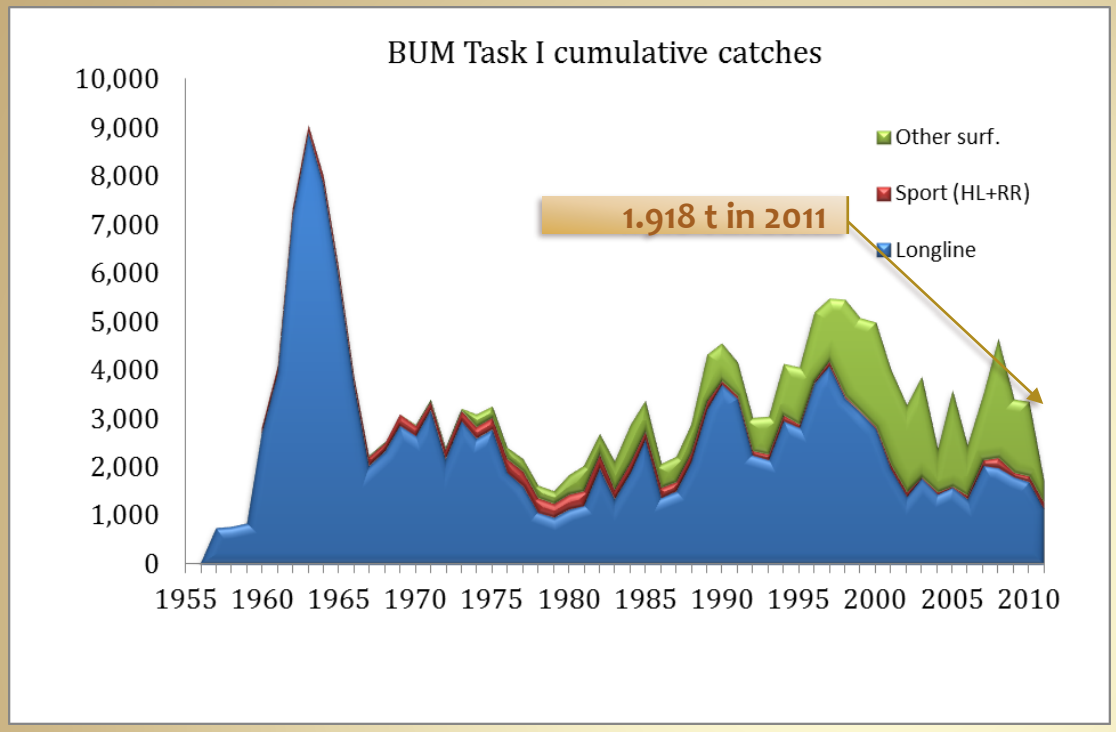
- **Atlantic istiophoridae** represents **9% of the world production** (average 2006-2010).

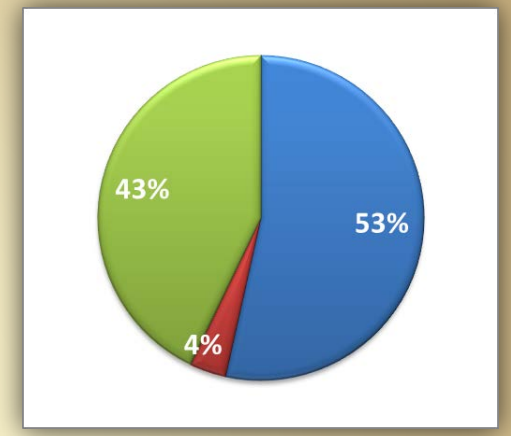
Blue marlin

Last assessment: 2011

1 management unit

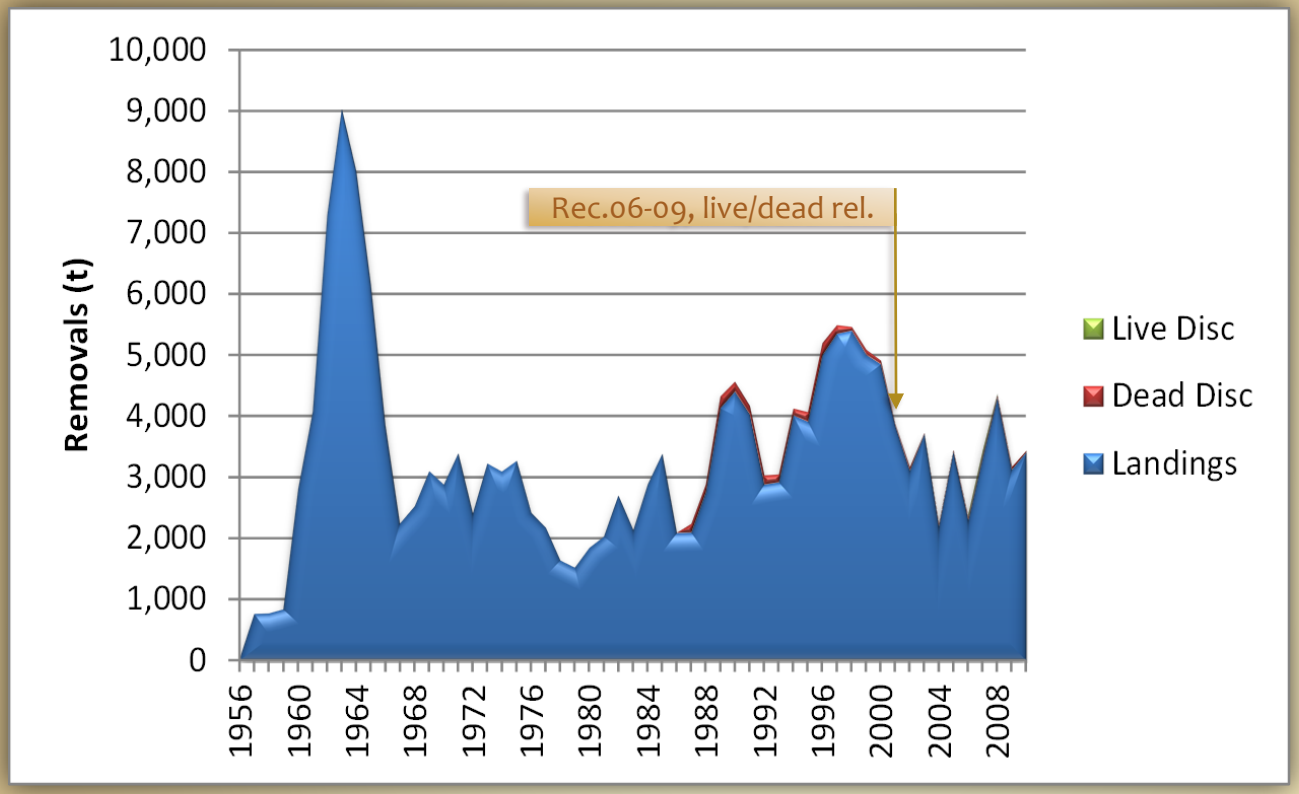
Blue marlin, Makaire bleu, aguja azul	
Scientific name	*Makaira nigricans*
Distribution	Widely distributed in subtropical and tropical waters of the Atlantic Ocean, and occasionally in temperate waters. From 50°N to 45°S, but they are less abundant in waters of the eastern central and the south central 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



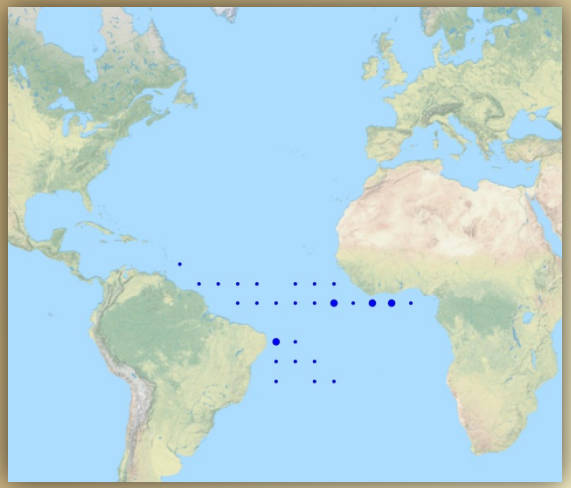


% average catch in 2006-2010

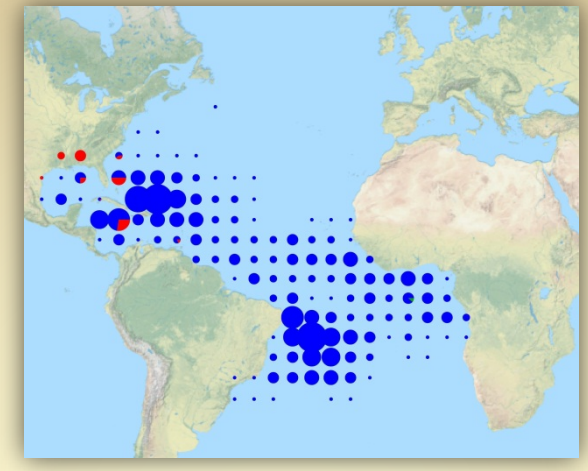
- Task I catches of BUM in 2011 were – 1,918 t (provisional); 3,358 t in 2010.
- Due to the work conducted by the Committee and improved reporting by CPCs the amount of unclassified billfish in the Task I table has been minimized.



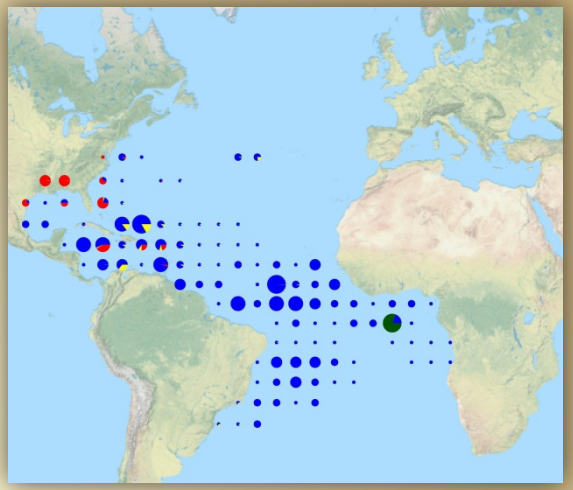
- Few CPCs reported Live Discards.
- Insufficient information on post- release survival precluded incorporation of potential mortality of the live discard fraction.



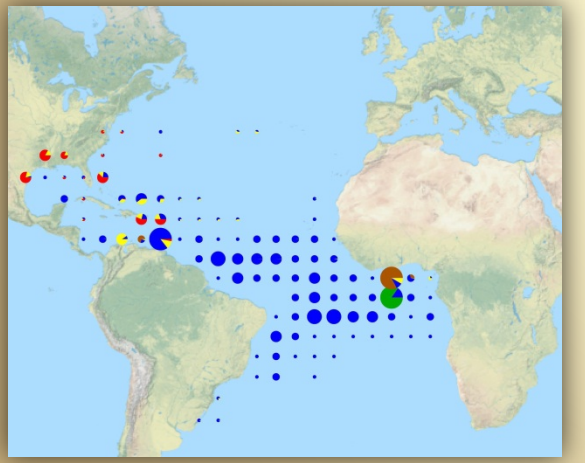
1950



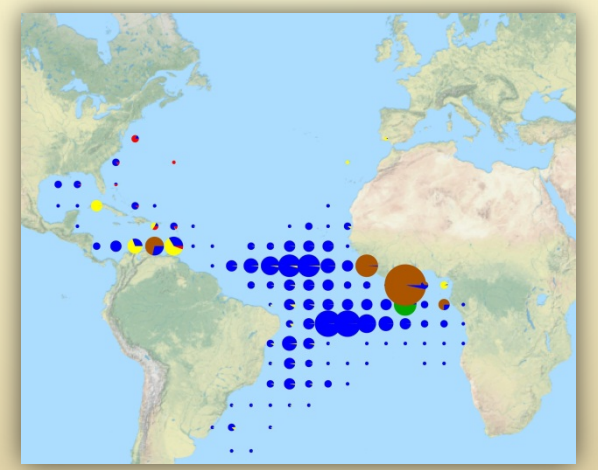
1960



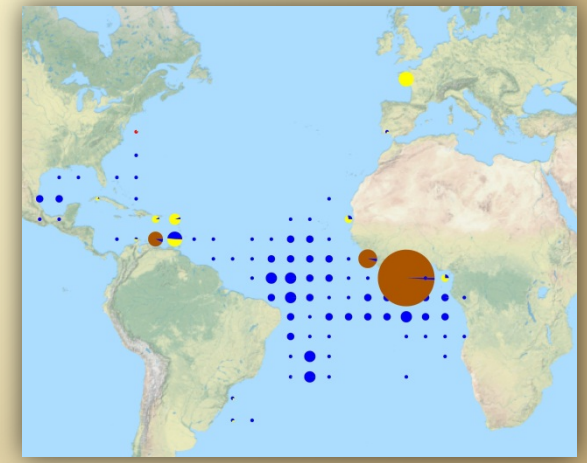
1970



1980

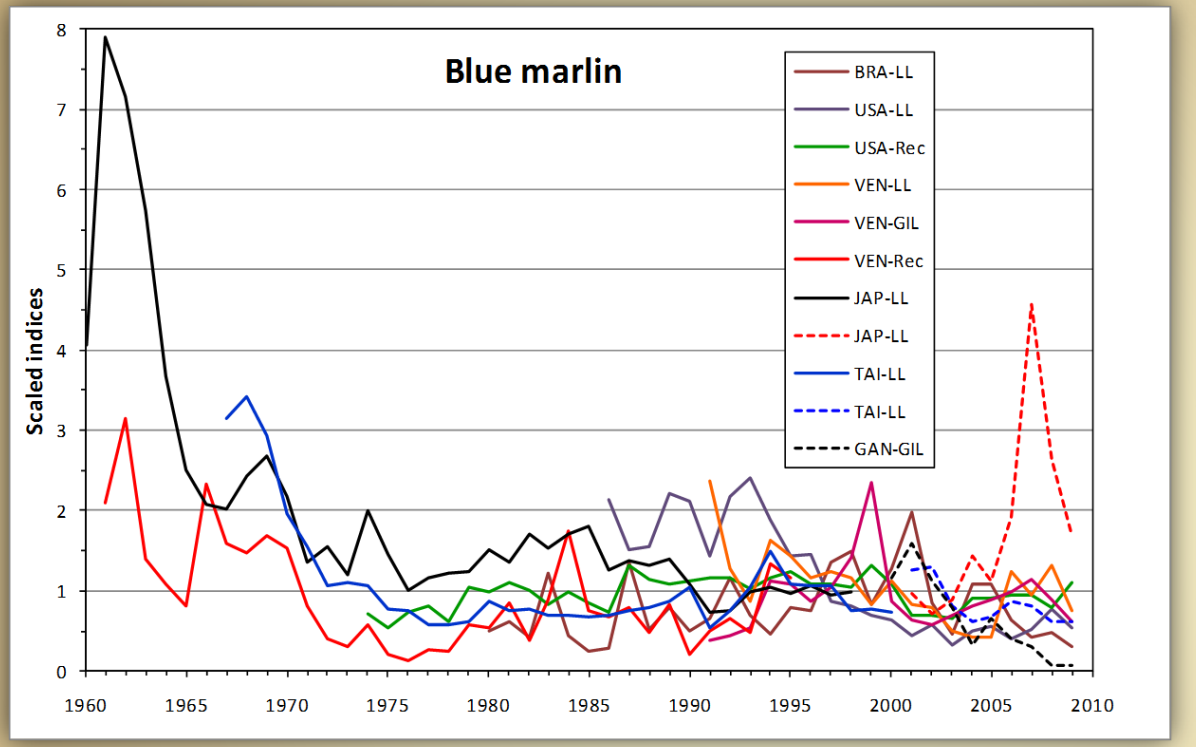


1990



2000

Purse seine Longline Others Gillnet Rod & Reel



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

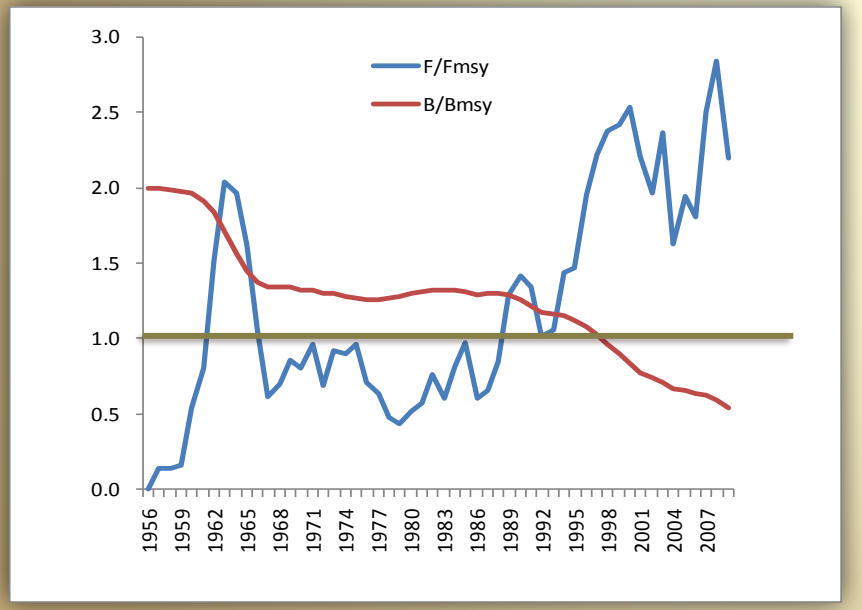
Brazilian LL; USA LL, Rec; Venezuelan LL, GIL, REC; Japanese LL (1960-1998;2001-2009); Chinese-Taipei LL (1968-2000; 2001-2009); Ghana GIL.

Stock status

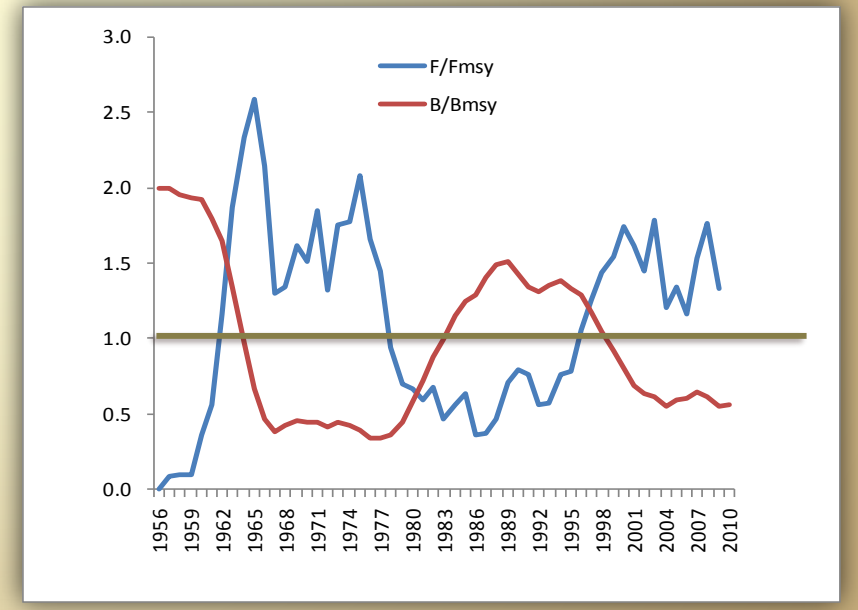
ASPIC

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)

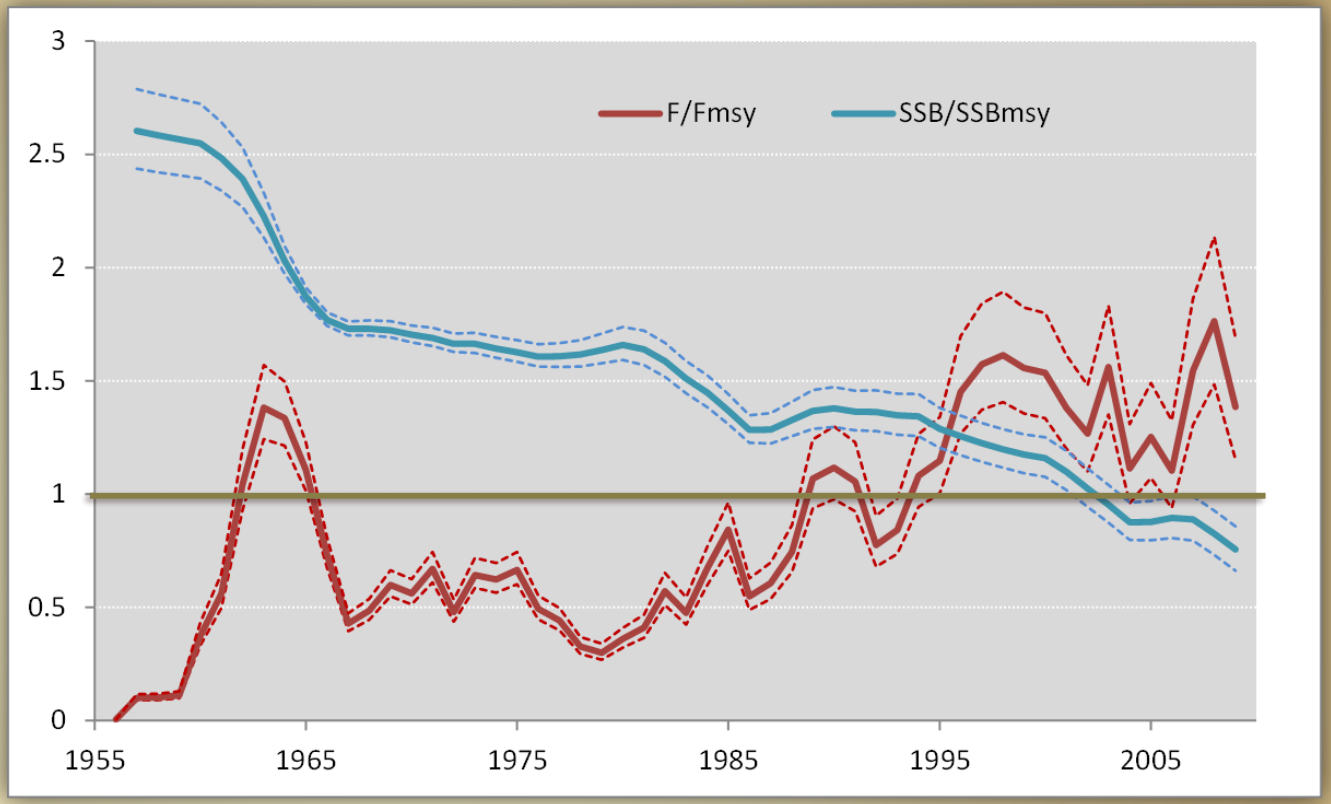


"high productivity" (MSY=4,300 t)

Stock status

SS3

Fully integrated stock synthesis model



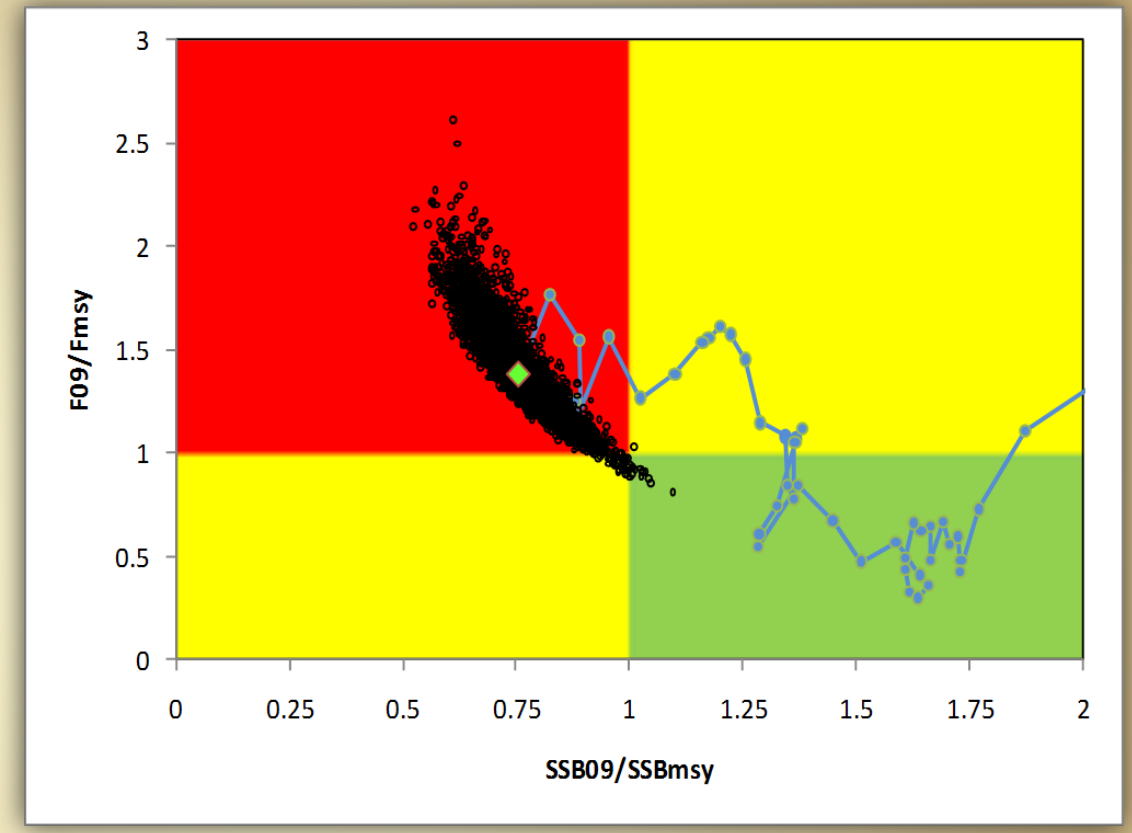
Results Base Case:

- 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

K2SM [$P(F \leq F_{MSY})$ & $P(SSB \geq SSB_{MSY})$]

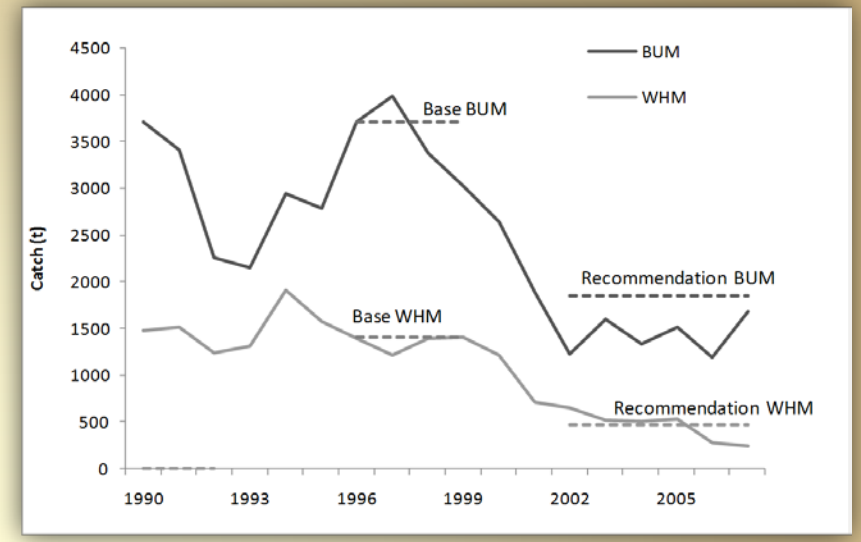
TAC	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
0	0%	2%	9%	19%	33%	49%	63%	74%	81%	87%	92%	94%	96%	97%	98%
500	0%	2%	6%	13%	23%	35%	47%	58%	67%	74%	80%	84%	88%	91%	93%
1,000	0%	1%	4%	9%	15%	22%	31%	40%	49%	56%	63%	68%	73%	77%	81%
1,500	0%	1%	3%	6%	9%	13%	18%	24%	30%	36%	41%	46%	50%	55%	59%
2,000	0%	1%	2%	3%	5%	7%	10%	12%	16%	18%	21%	24%	27%	29%	32%
2,500	0%	1%	1%	2%	3%	3%	4%	5%	6%	7%	8%	9%	10%	11%	12%
3,000	0%	0%	1%	1%	1%	2%	2%	2%	2%	2%	3%	3%	3%	3%	3%
3,500	0%	0%	0%	0%	0%	0%	0%	1%	1%	0%	0%	0%	0%	0%	0%
4,000	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	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 B_{MSY} 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.

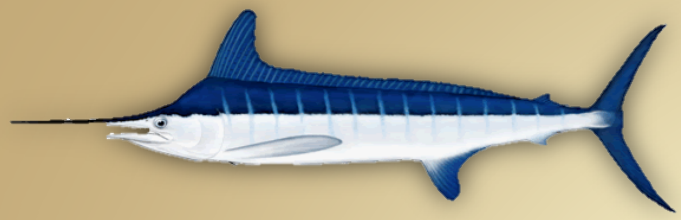
- The COM should implement management measures to **immediately reduce fishing mortality on BUM stock** by adopting a **TAC** that allow the stock to increase (**2,000 t or less**, including dead discards):

- To facilitate the implementation of the TAC, the Commission may consider the **adoption of measures such as**, but not limited to the mandated use of **non-offset circle hooks**.

  a) The Committee considers that this approach may be more efficient and enforceable than time-area closures.
  b) Currently, 3 ICCAT member nations (Brazil, Canada, and the U.S.) already mandate or encourage the use of circle hooks on their pelagic longline fleets.
  c) In addition, reducing fishing mortality of blue marlin from non-industrial fisheries should be considered.

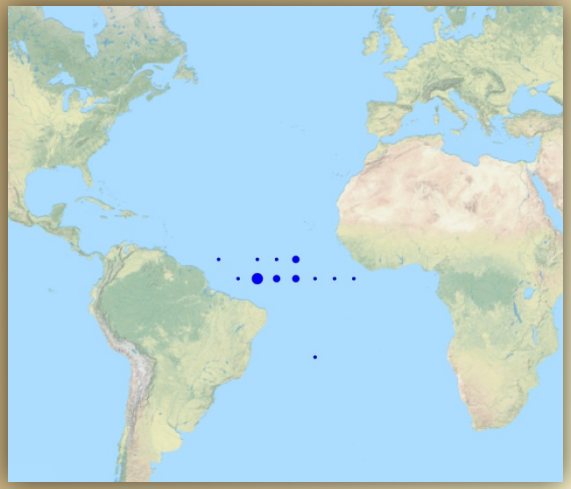
White marlin

Last assessment: 2012

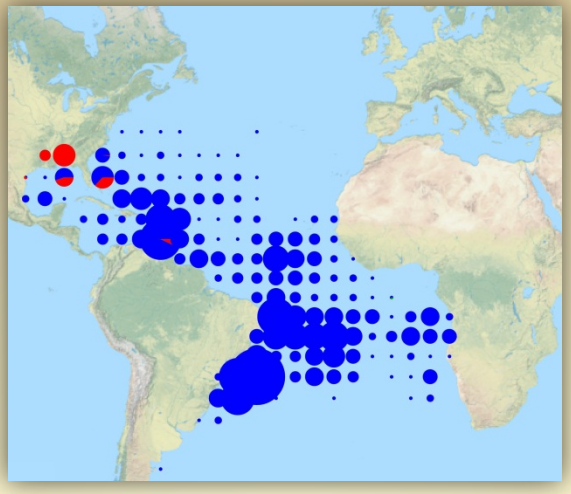


1 management unit

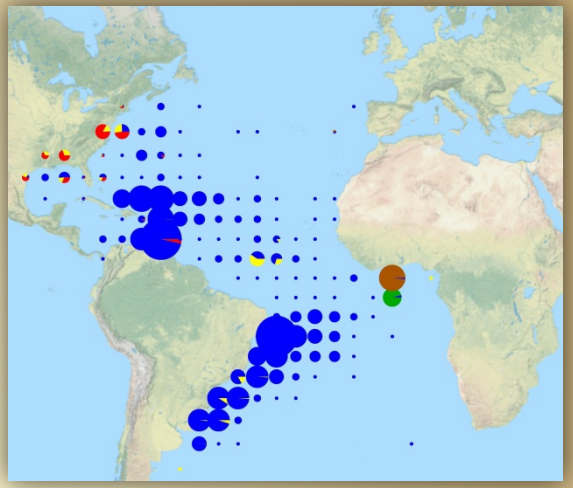
White marlin, Makaire blanc, aguja blanca	
Scientific name	*Tetrapturus albidus*
Distribution	Widely distributed in subtropical and tropical waters of the Atlantic Ocean, and occasionally in temperate waters and in the Mediterranean Sea. From 55°N to 45°S, but they are less abundant in waters of the 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



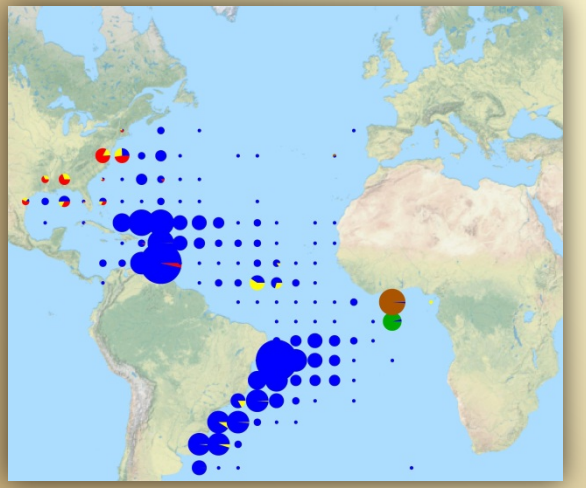
1950



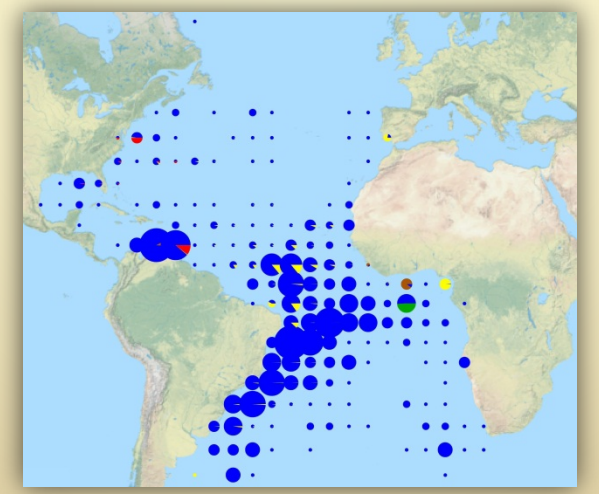
1960



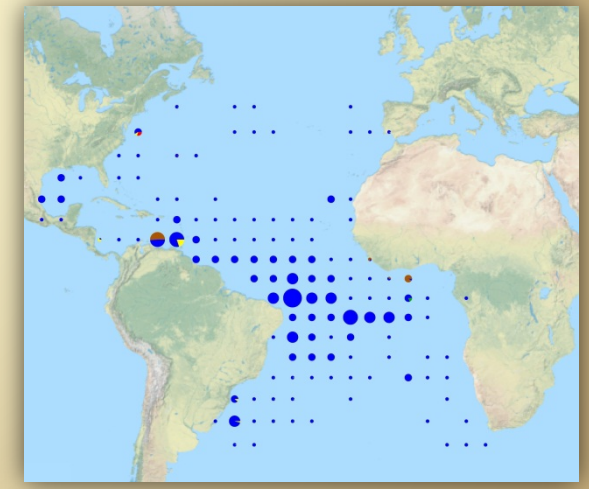
1970



1980

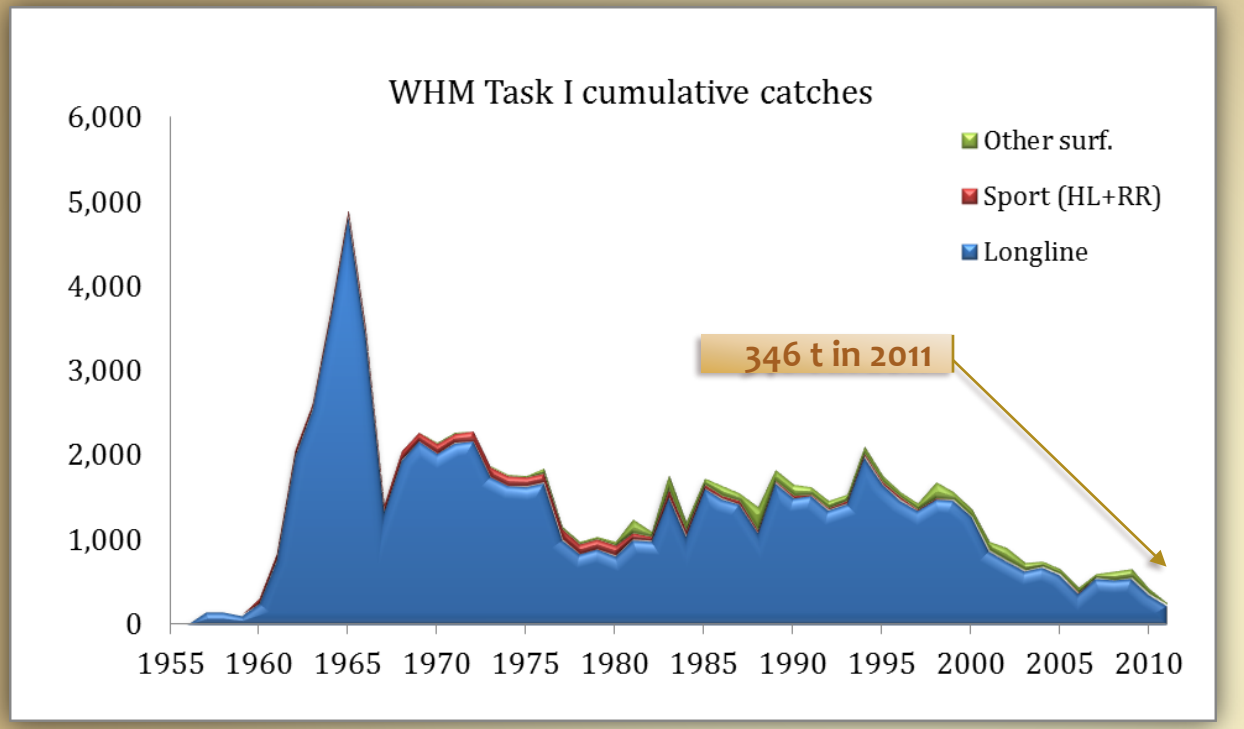


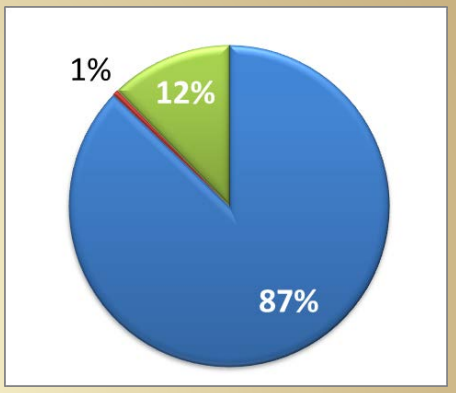
1990



2000

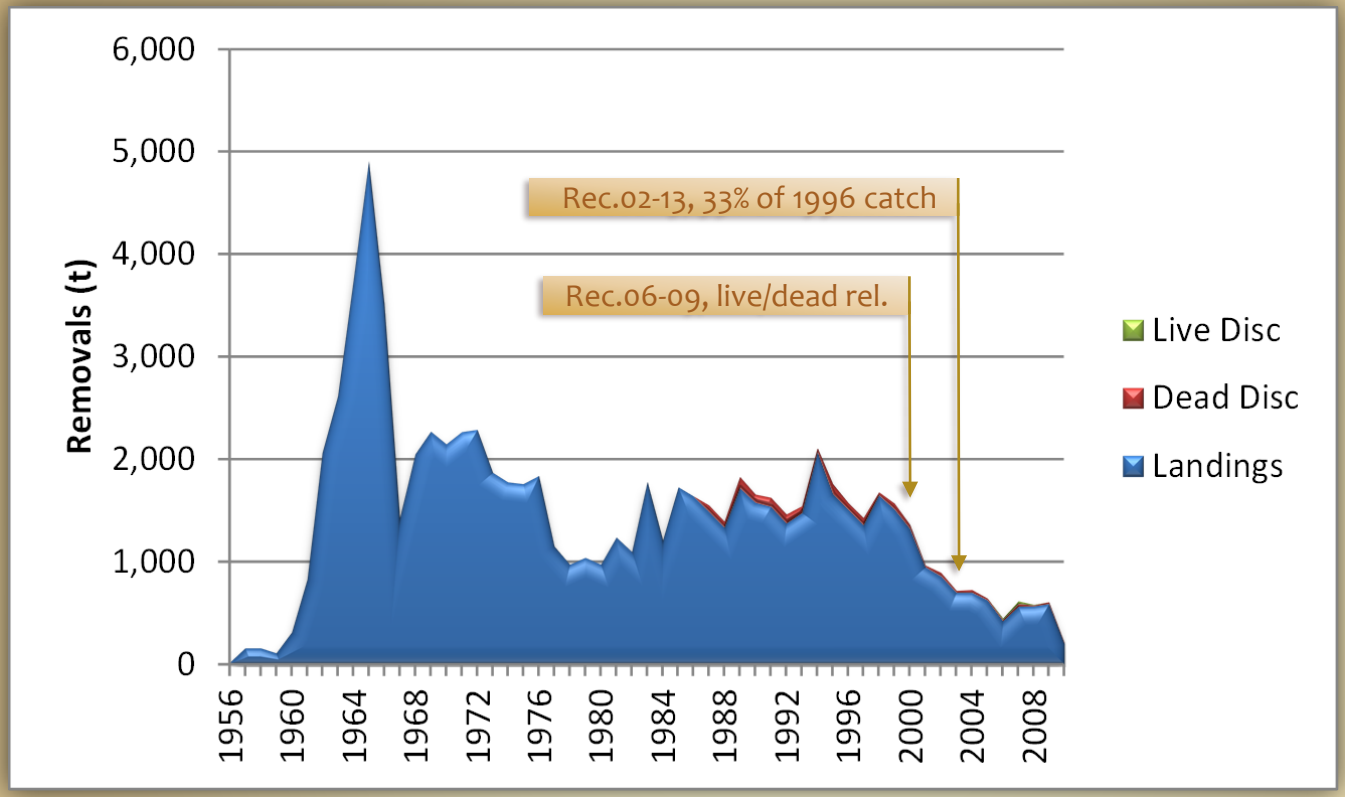
Purse seine Longline Others Gillnet Rod & Reel





% average catch in 2007-2011

- Task I catches of WHM in 2010 and 2011 were 431 t and **346 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.**
- Insufficient information on post-release survival precluded incorporation of potential mortality of the live discard fraction.

Estimation of WHM catch

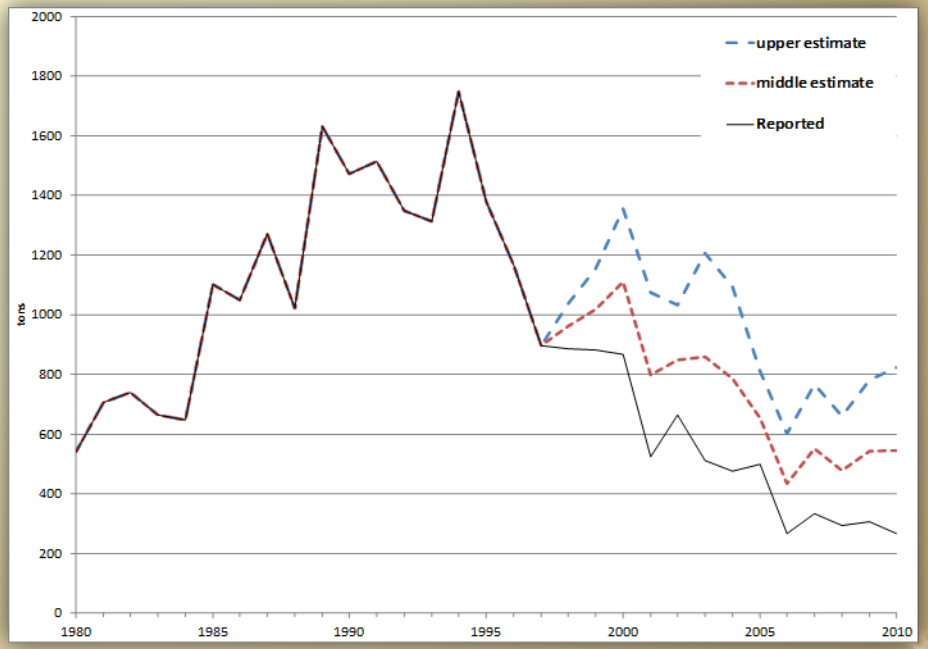
- **Uncertainties in the magnitude of the catches: starting in 2002** when CPCs were mandated to release billfish that were alive at haulback.

- **Decrease in reported landings** (up to 75% compared to the late 1990's) but not necessarily a decrease in fishing and/or release mortality.

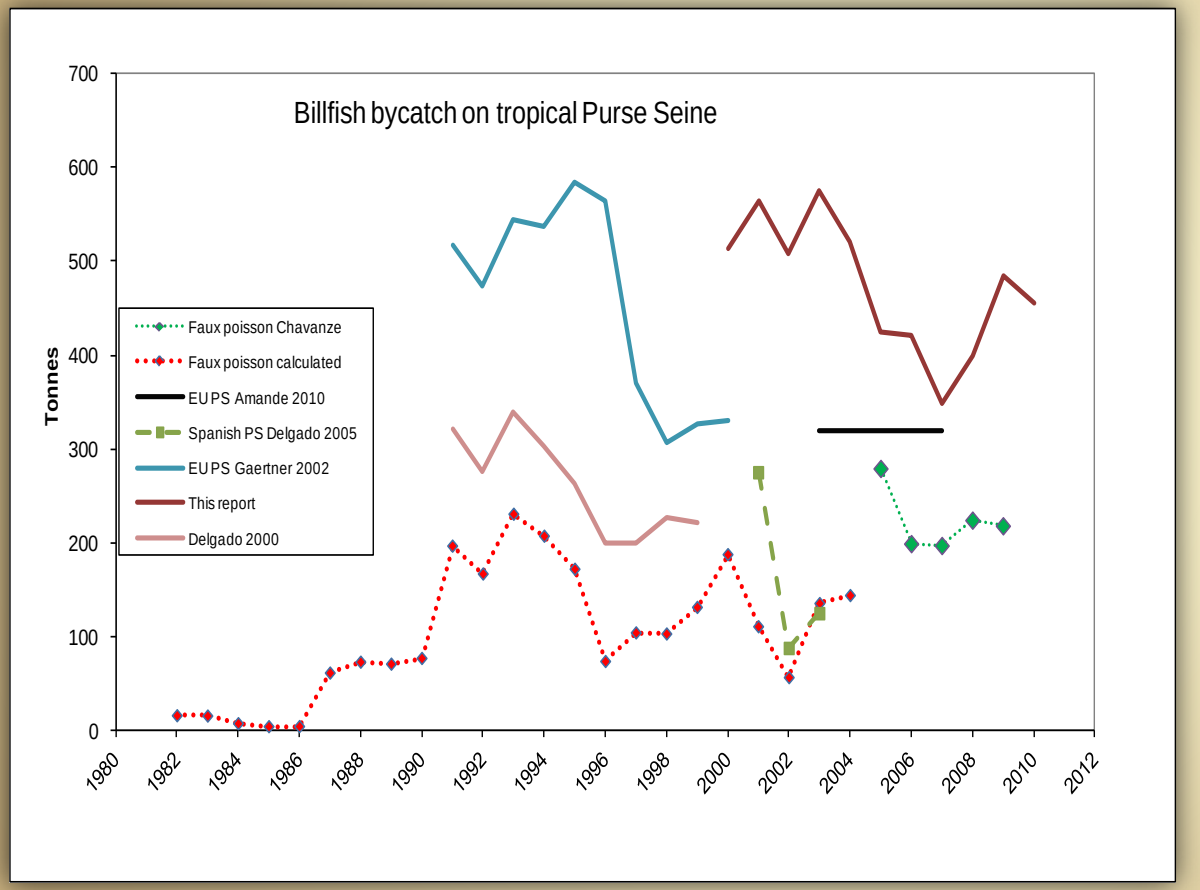
- Significant reductions in the **fishing effort for the longliners**; this reduction does not fully account for the reductions of WHM catches.

3 catch scenarios:

- Low: Reported (Task 1),
- High: Prop. catch of major flts. 95-97
- Middle



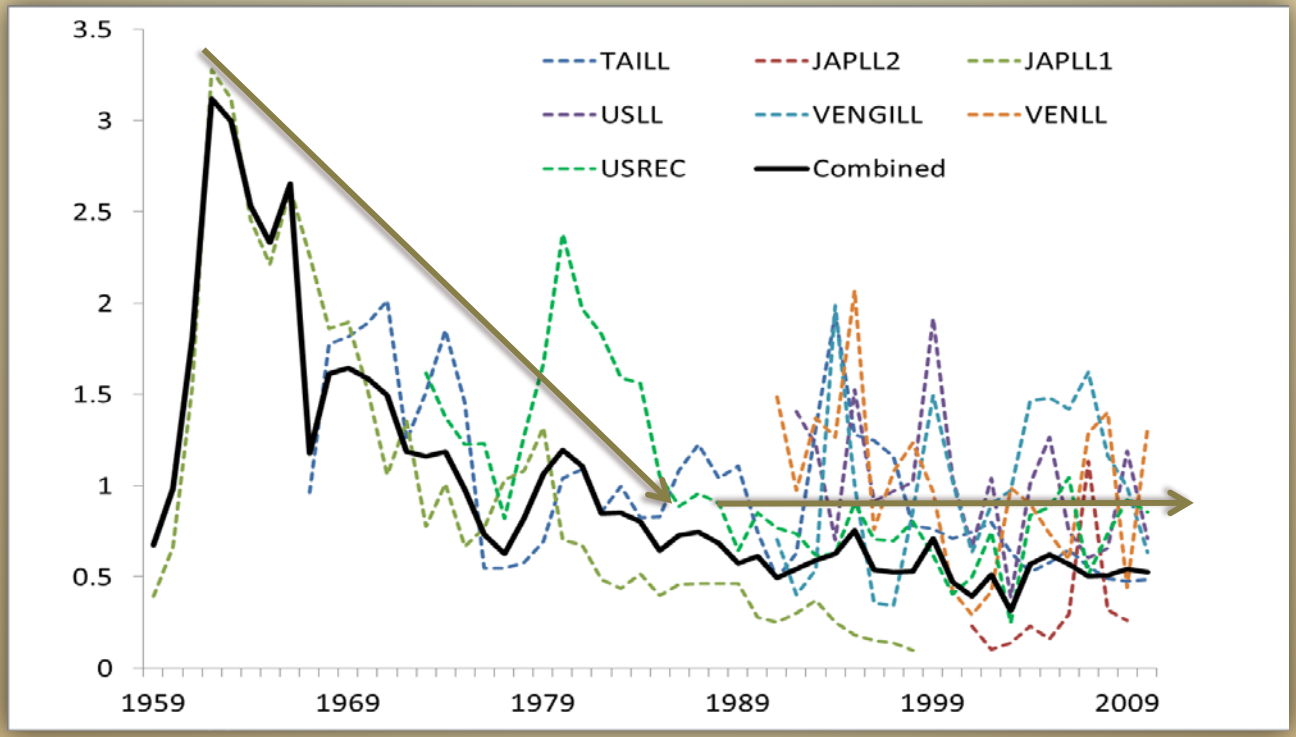
Estimation of WHM bycatch from the tropical tuna purse seine



	WHM (t)
2000	12
2001	13
2002	12
2003	13
2004	13
2005	11
2006	10
2007	9
2008	10
2009	10
2010	12

Indices of abundance of WHM

- **7 CPUE series** were selected for their inclusion in the assessment models.
- No discerning trend during the latter part of the time series.
- A combined CPUE index showed a **sharp decline during the period 1960-1991**, and a relatively **stable trend thereafter**



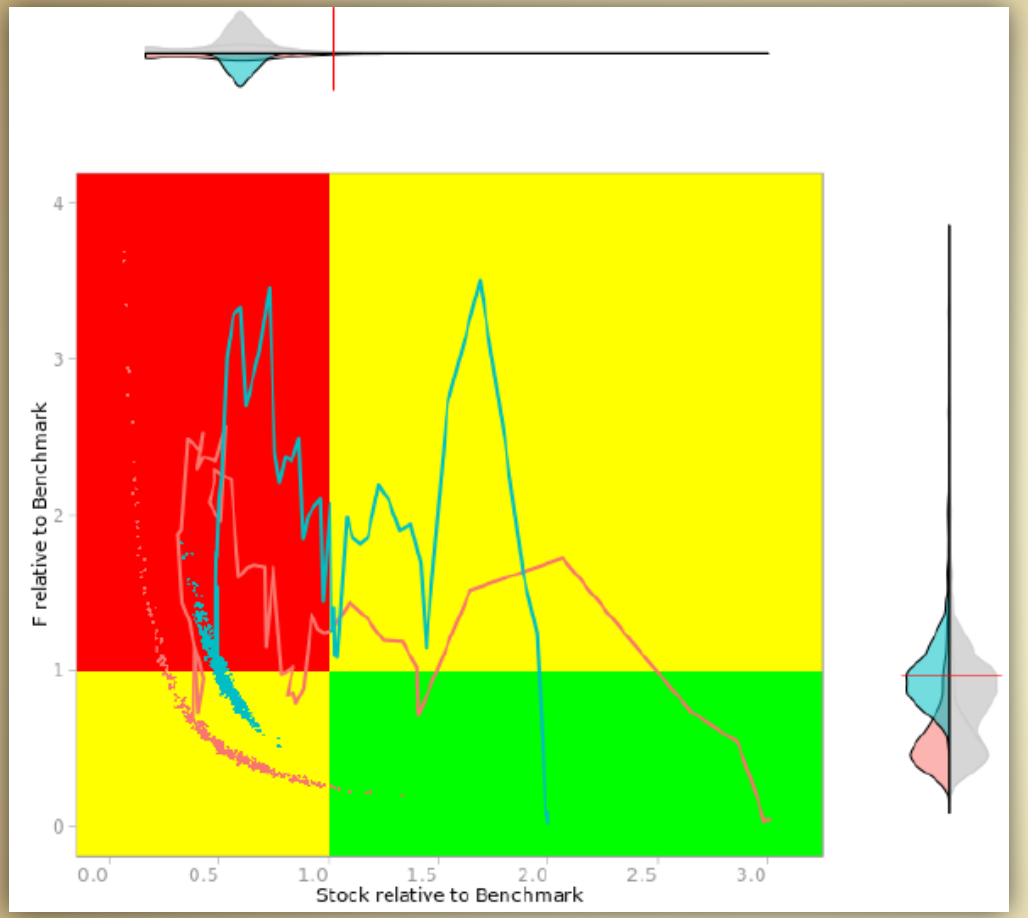
Stock status

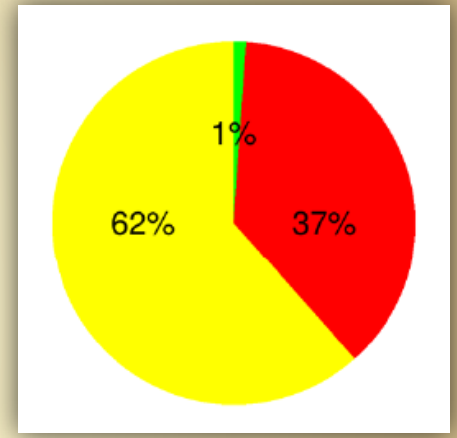
- Two models were used: a surplus production model (**ASPIC**), and a fully integrated model (**SS3**).

- The most important **uncertainty** was that associated with the **catch data** (species composition & magnitude of the catch), especially starting in 2002 when CPCs were mandated to release billfish that were alive at haulback.

- This apparent drop in landings lead to a marked decrease in the estimates of F/F_{MSY} from 2002-present. However the Committee considers that this trend is likely overly optimistic due to unreported catch and unaccounted release mortality.

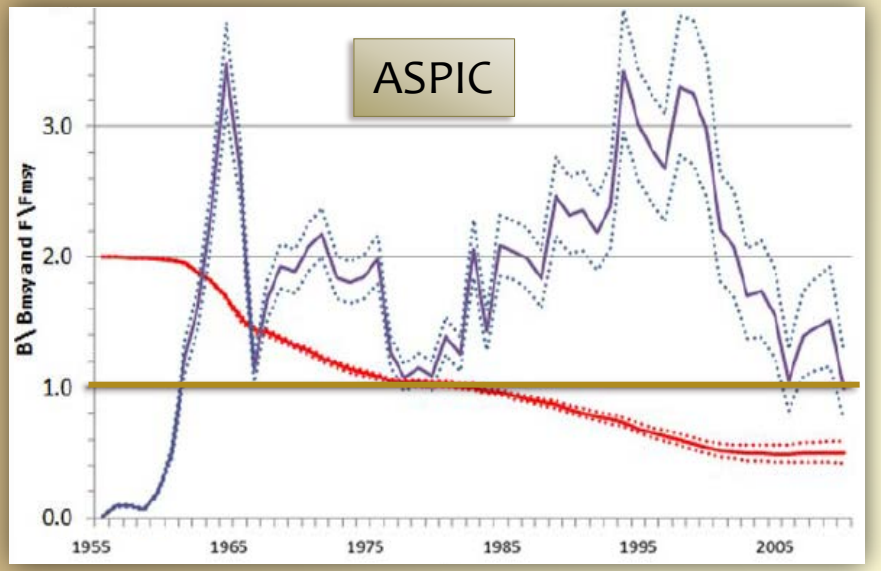
Stock status

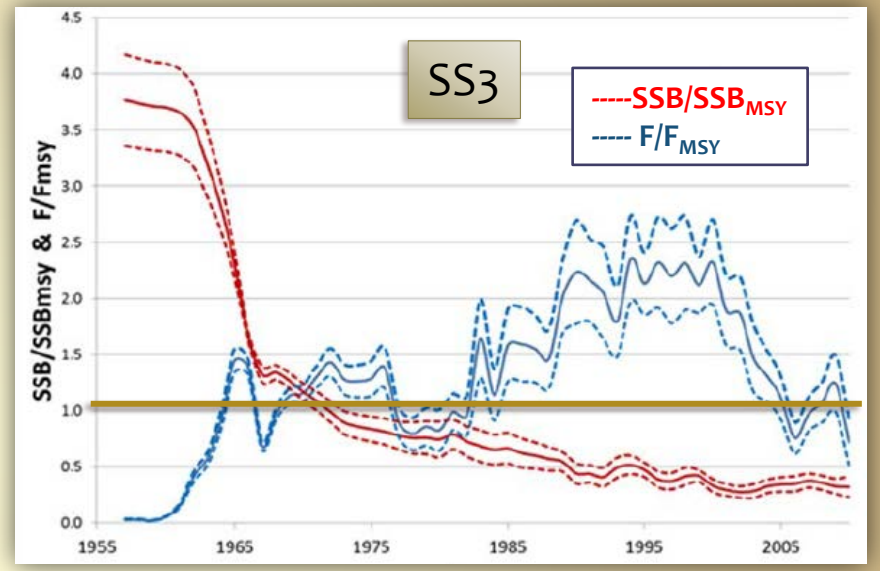




- The results of the 2012 assessment indicated that the stock remains **overfished** but **most likely not undergoing overfishing**

Stock status





- The results of the 2012 assessment indicated that the stock remains **overfished** but **most likely not undergoing overfishing**

Outlook

$P(F \leq F_{MSY})$

TAC	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
0	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
200	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
400	73%	74%	75%	77%	79%	79%	81%	82%	84%	85%
600	9%	11%	12%	12%	13%	14%	16%	16%	17%	19%
800	0%	0%	0%	0%	1%	1%	1%	1%	1%	1%
1,000	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

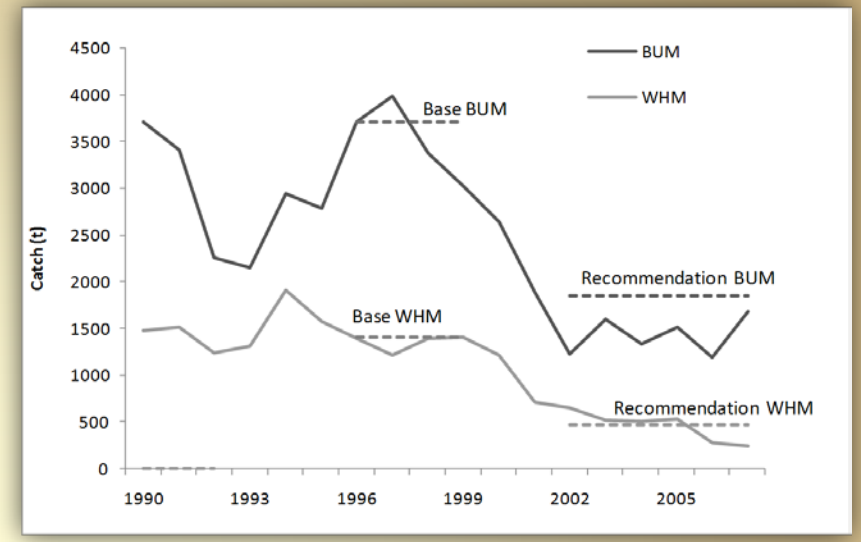
$P(SSB \geq SSB_{MSY})$

TAC	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
0	0%	0%	0%	0%	0%	0%	0%	1%	1%	2%
200	0%	0%	0%	0%	0%	0%	0%	0%	1%	1%
400	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
600	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
800	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
1,000	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

- The outlook for this stock remains **uncertain** (reported catches & productivity).
- At current catches of about **400 t** the stock will likely increase in size, but is very unlikely to rebuild to B_{MSY} in the next ten year period.
- Fishing mortality is highly likely to remain **below F_{MSY}**.
- The speed at which the stock biomass may increase and the time necessary to rebuild the stock to B_{MSY} remains **highly uncertain**.

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 has been at about the 33% of the 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.

- More countries have started reporting data on live releases in 2006. 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

- The inability to accurately estimate fishing mortality will continue to compromise our ability to monitor the stock's recovery period. This is due to the **inadequate reporting of discards,** as well as the **lack of reports from some artisanal and recreational fisheries** that take marlin species.

- It is therefore recommended that measures taken to ensure that **monitoring and reporting of discards,** including live releases, are appropriate and accurate.

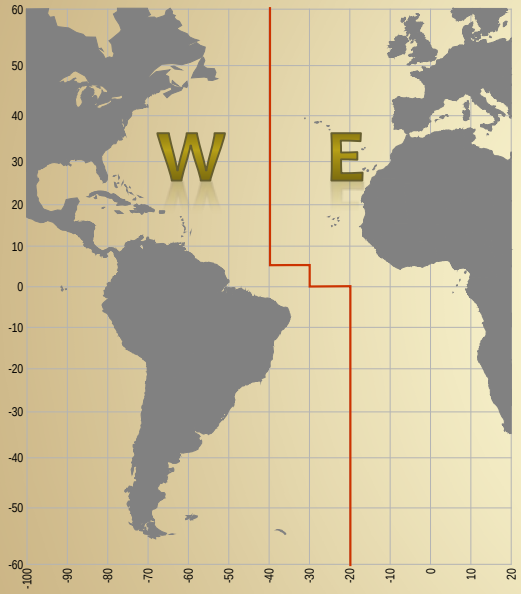
- Until then the Commission, at the minimum, should ensure **catches do not exceed current levels.**

- One approach to reduce fishing mortality could be the use of **non-offset circle hooks** as terminal gear.

  a) The Committee considers that this approach may be more efficient and enforceable than time-area closures.
  b) Currently, 3 ICCAT members (Brazil, Canada, and the U.S.) already mandate or encourage the use of circle hooks on their pelagic longline fleets.
  c) Reducing fishing mortality of WHM from non-industrial fisheries should be considered.

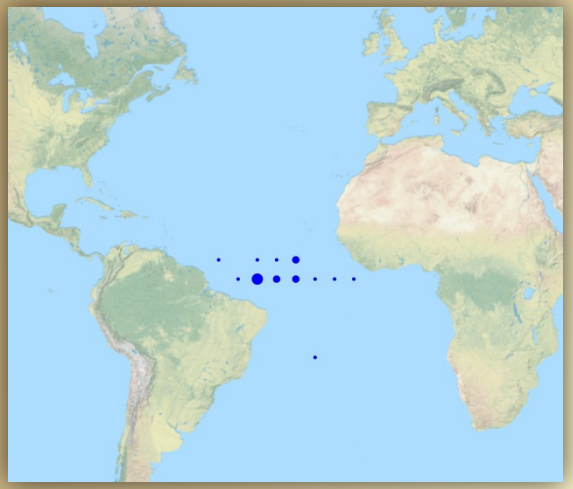
Sailfish

Last assessment: 2009

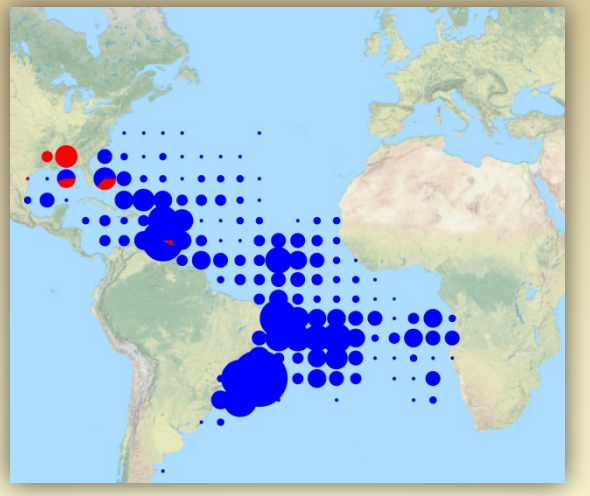


2 management units

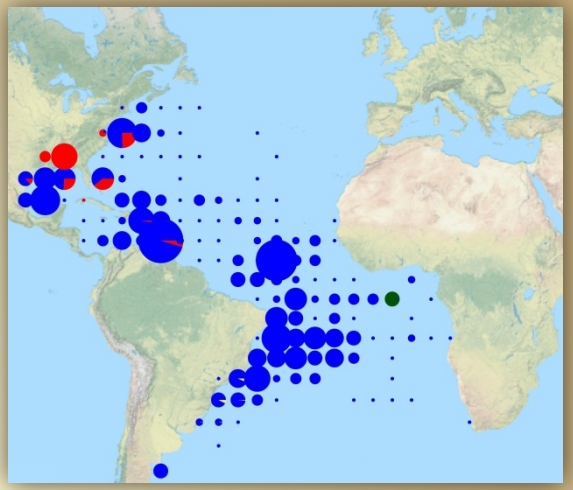
Sailfish, Voiliere, Pez Vela	
Scientific name	*Istiophorus albicans*
Distribution	Widely distributed in subtropical and tropical waters of the Atlantic , and occasionally in temperate waters and in the Mediterranean Sea. It is the least oceanic of the Atlantic billfishes; shows a strong tendency to approach 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



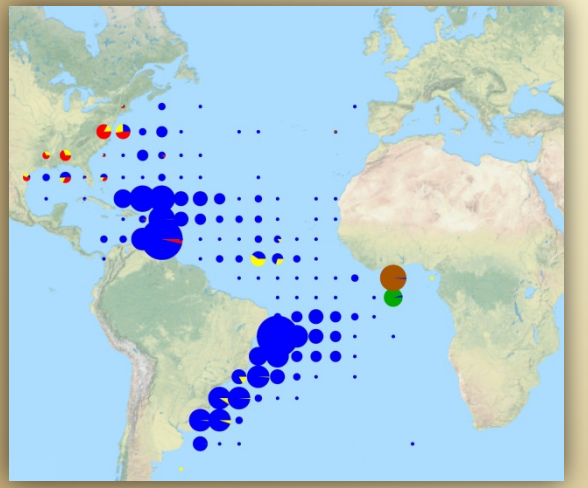
1950



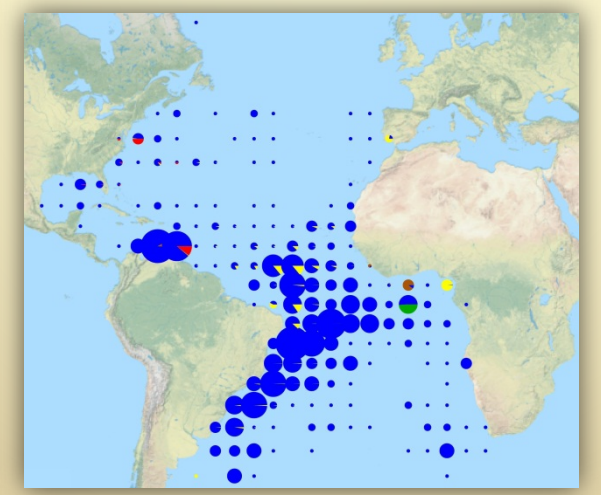
1960



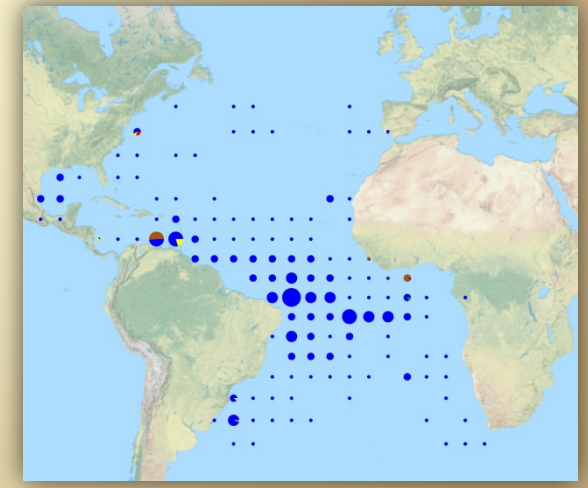
1970



1980

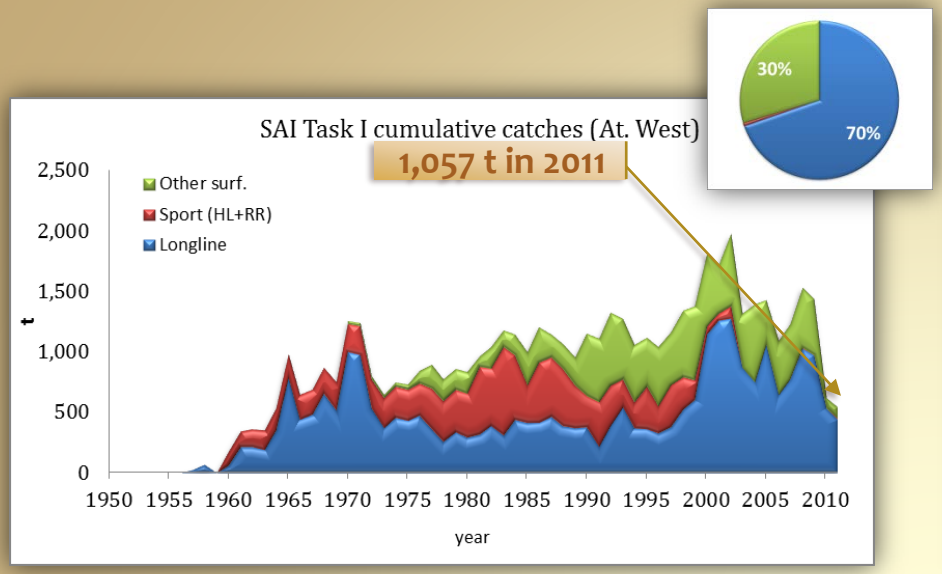


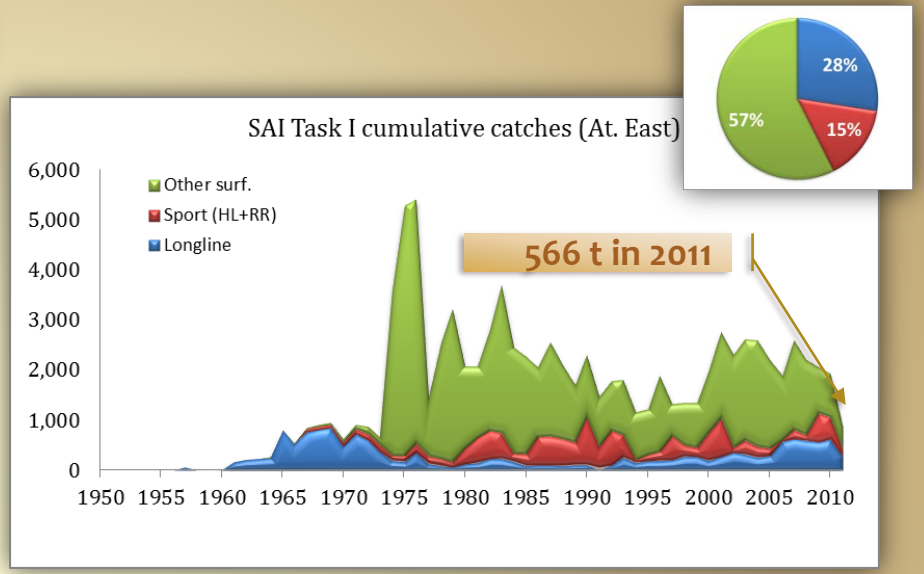
1990



2000

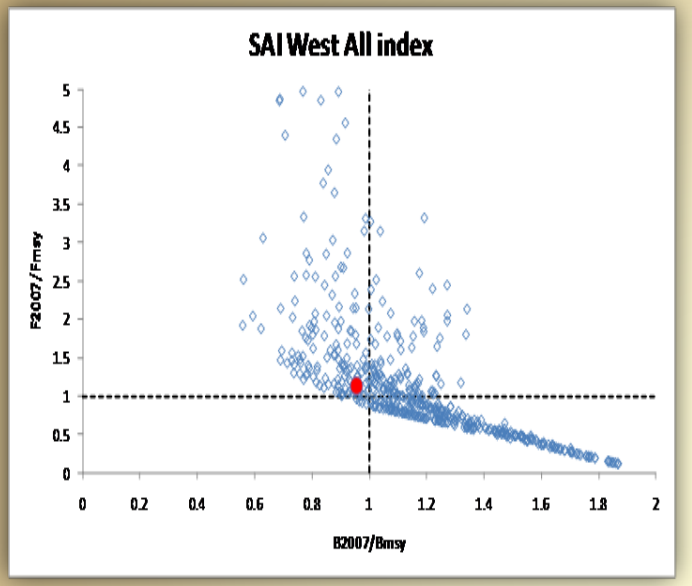
Purse seine **Longline** **Others** **Gillnet** **Rod & Reel**

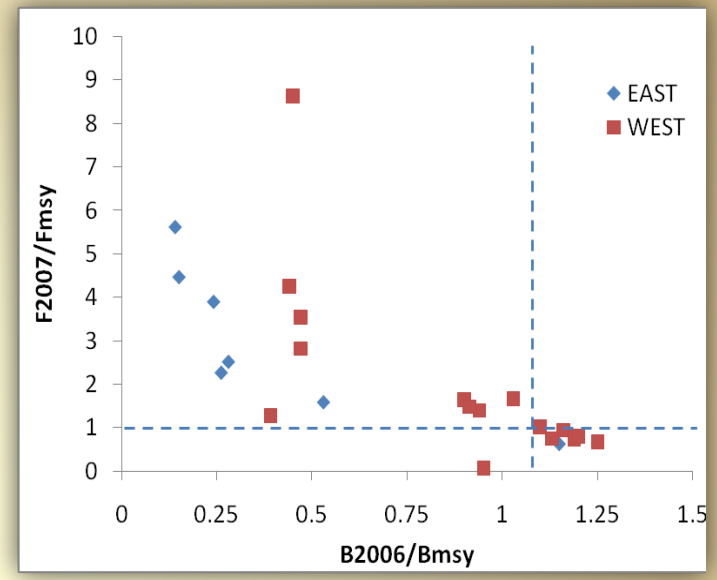




- SAI are targeted by coastal artisanal and recreational fleets and are caught as by-catch in LL and PS.
- Historically, catches of SAI were reported together with spearfish by many LL fleets, making the estimation of SAI catch difficult.
- Incomplete reporting of sailfish catches, particularly for the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

Stock status





SAI Summary	West Atlantic	East Atlantic
MSY	600-1,100 t	1,250-1,950 t
2011 catches (prov.)	**566 t**	**1,067 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.**

Effects of current regulations

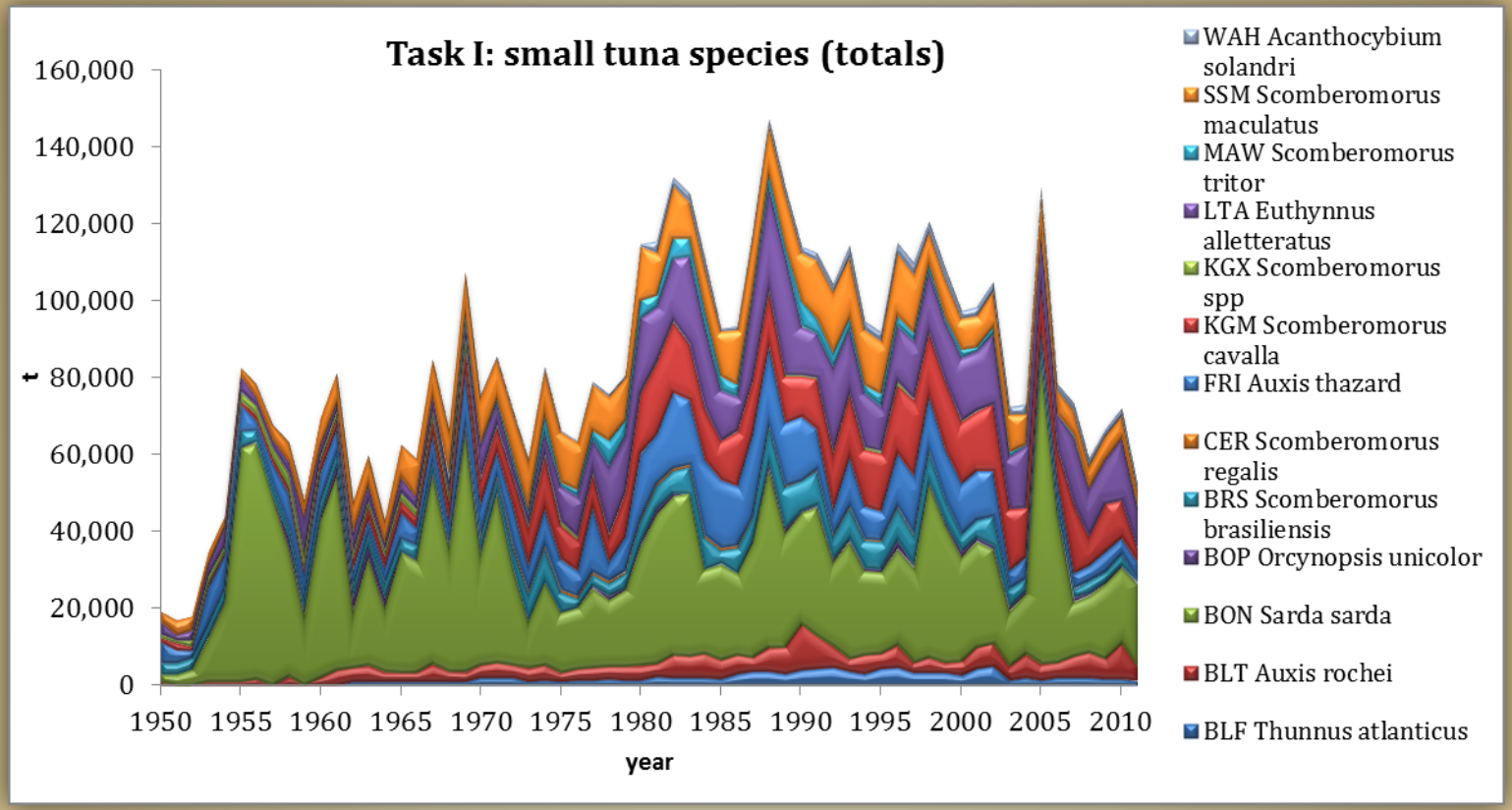
- **No ICCAT regulations** for sailfish are in effect.
- However, some countries have established **domestic regulations** to limit the catch of sailfish. Among these regulations are, requirement of releasing all billfish from longline vessels, minimum size restrictions, use of cricle hooks and catch and release strategies in sport fisheries.

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 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.
- One approach to reduce fishing mortality could be the use of non-offset circle hooks as terminal gear.
- 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)

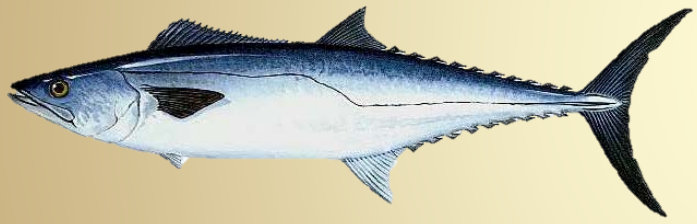


- Small tuna species have a very **high relevance from a socio-economic point of view,** because they are important for many coastal communities in all areas and are a main source of food.
- Small tunas are exploited mainly by **small-scale/artisanal fisheries,** although substantial catches are also 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.
- in the absence of any stock assessment for SMT, no ICCAT management recommendation have been made so far.

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 (small-scale/artisanal, 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.

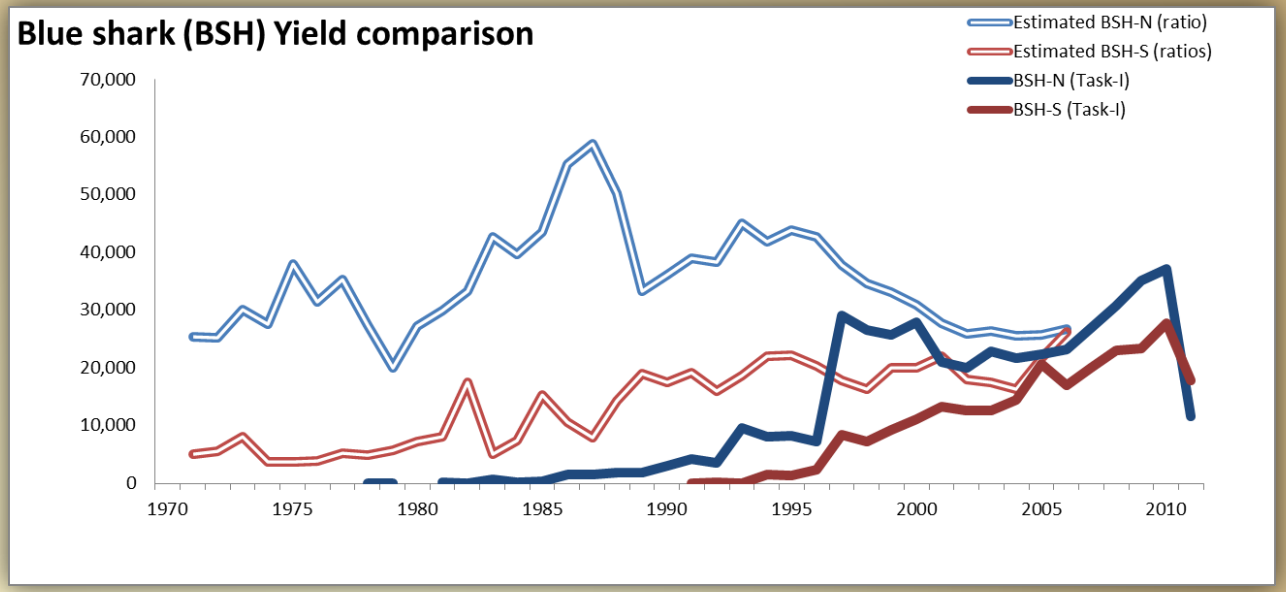
Scientific collaboration between ICCAT, Regional Bodies and countries in the various regions is imperative to advance understanding of the distribution, biology and fisheries of these species

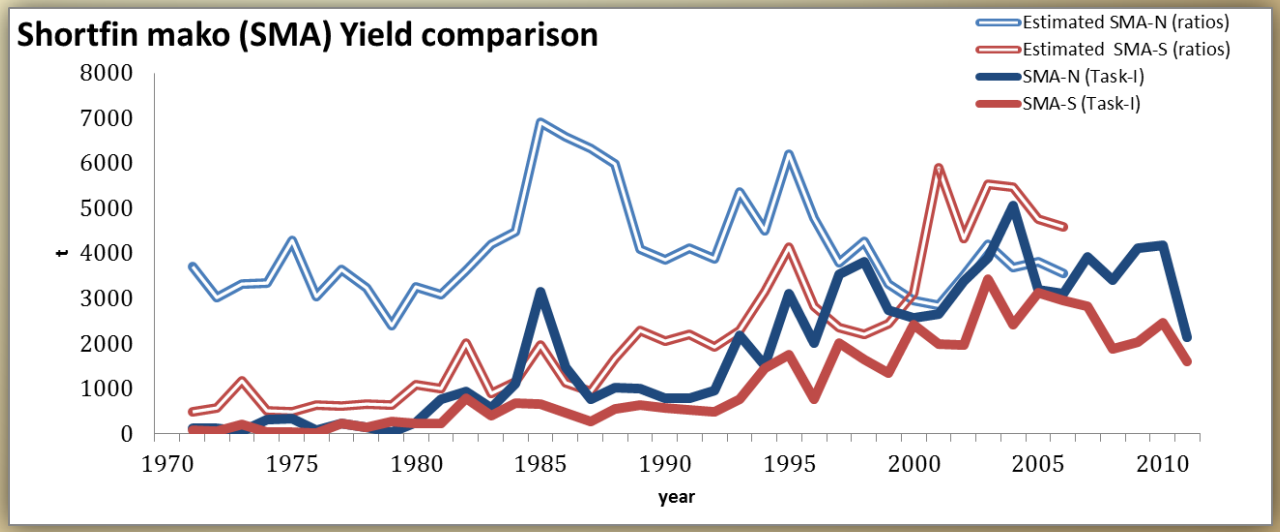
Sharks

2012	ERA - 16 shark species (20 stocks)
2012	Shortfin mako
2008	Blue shark (Prionace glauca)
2009	Porbeagle (Lamna nasus)

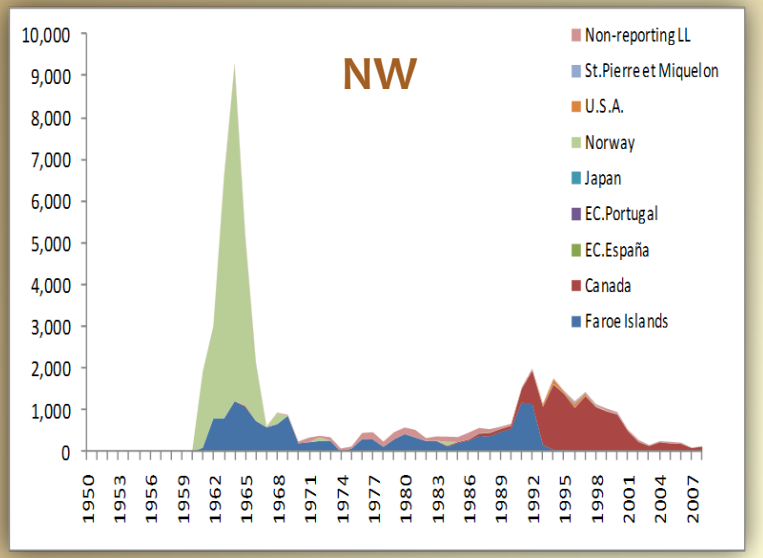
Fishery indicators

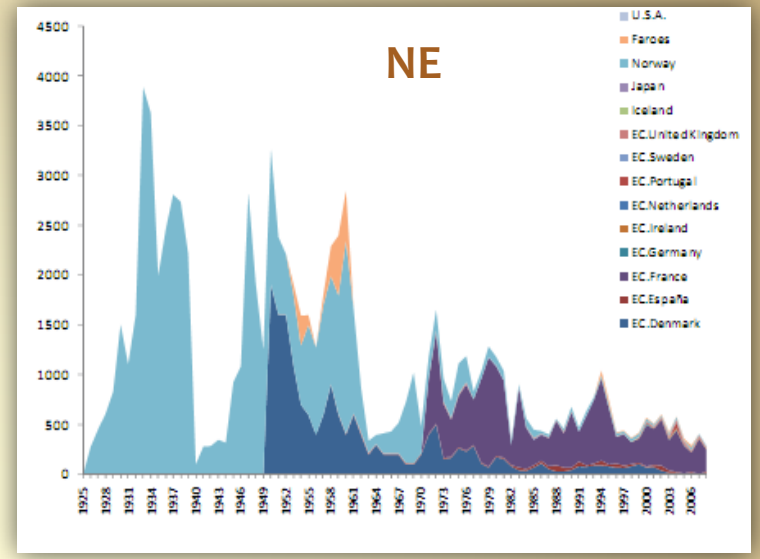
Though **global statistics on SHK catches** included in the ICCAT database have **improved,** they are **still insufficient** to allow the SCRS to provide quantitative advice on stock status with sufficient precision to guide fishery management toward optimal harvest levels.

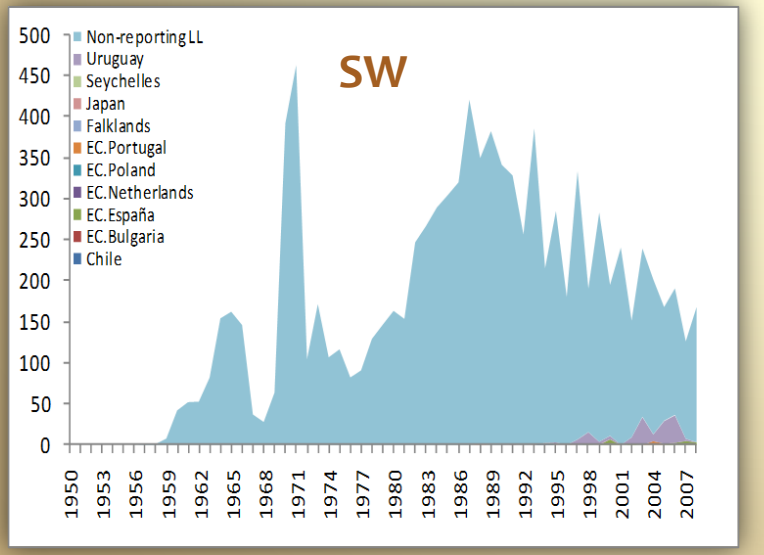




Fishery indicators (porbeagle)

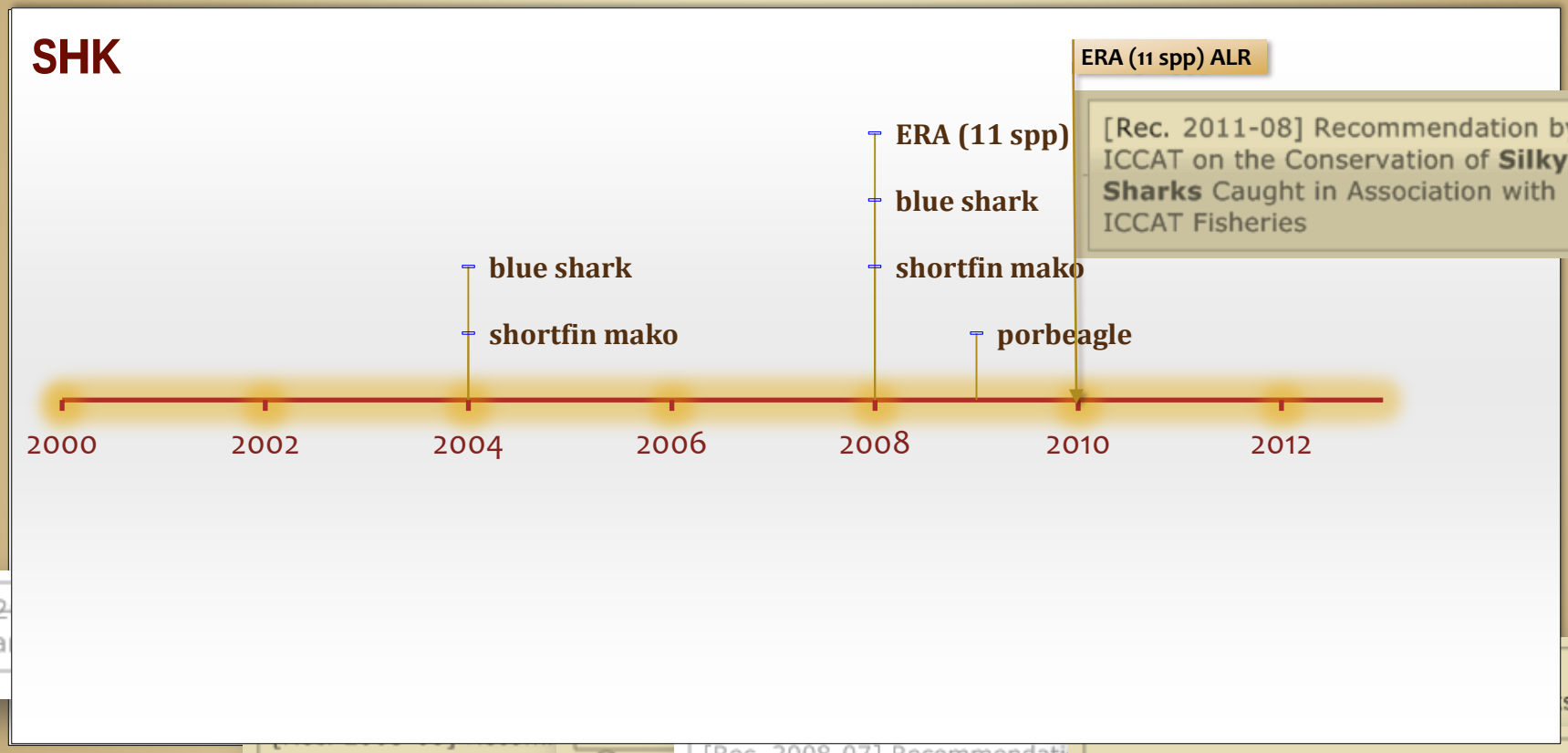






Though **global statistics on SHK catches** included in the ICCAT database have **improved,** they are **still insufficient** to permit the SCRS to provide quantitative advice on stock status with sufficient precision to guide fishery management toward optimal harvest levels.

Timeline of SHK Stock Assessments & Management recommendations



[Res. 2
on Atla

ICCAT to Amend Recom
04-10 Concerning the Conservati
Sharks Caught in Association wit
Fisheries Managed by ICCAT

[Rec. 2008-07] Recommendati
ICCAT on the Conservation of E
Thresher Sharks (Alopias super
caught in Association with Fishe
Managed by ICCAT

[Rec. 2010-07] Recommendation by ICCAT on the conservation of oceanic **whitetip** shark caught in association

[Rec. 2010-08]Recommendation by ICCAT on **hammerhead sharks** (family Sphyrnidae) caught in association with fisheries managed by ICCAT

[Rec. 2004-10] Recommendation by ICCAT concerning the conservation sharks caught in association with fisheries managed by ICCAT

[Res. 2008-08] Resolution by I
Porbeagle Shark (Lamna nasu

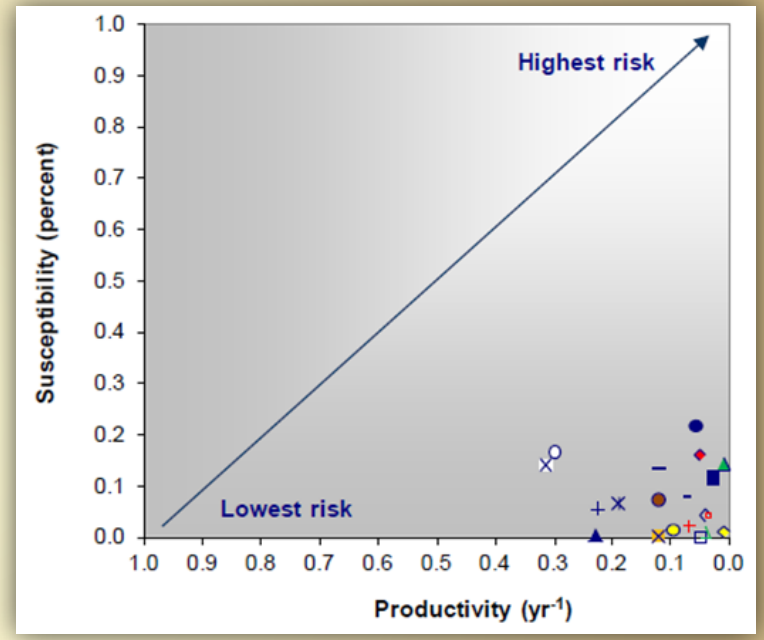
Ecological Risk Assessment (ERA)

Score Productivities

- Life history features: age at maturity, maximum age, age-specific fecundity, age-specific survival

Score Susceptibilities

- Availability
- Encounterability
- Selectivity
- Post-capture mortality



- **Availability;** the fished proportion of the area occupied by the species.
- **Encounterability;** the likelihood of encountering gear if it is fished in the occupied area
- **Selectivity;** the likelihood of capture if the gear is encountered
- **Post-capture mortality;** the likelihood of death after capture and discarding.

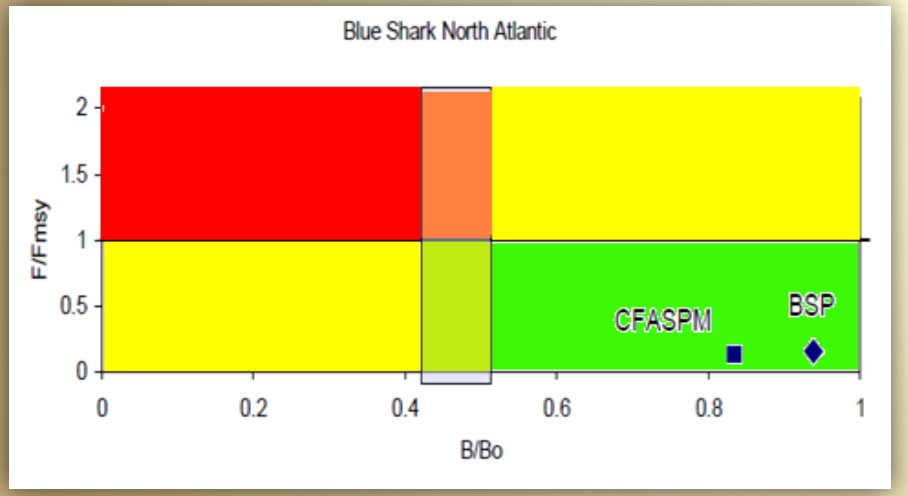
ERA 2012

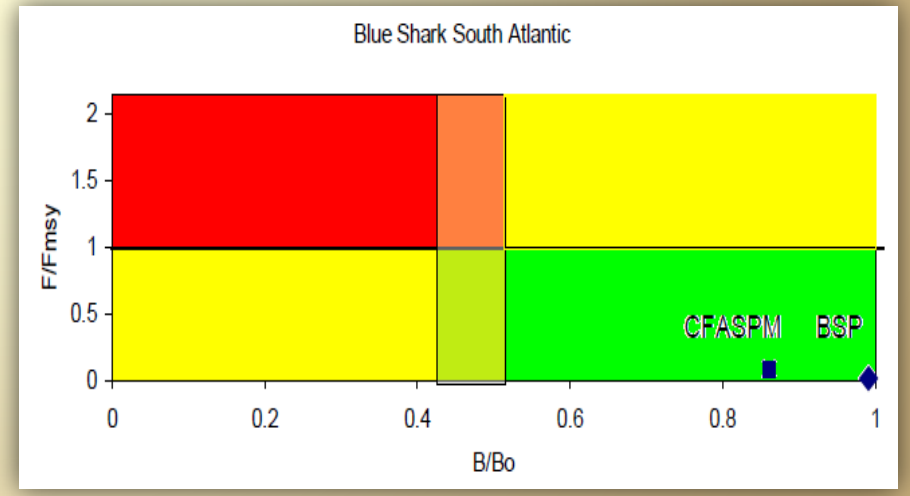
Species	Species (Eng)	Species (Spa)	Species (sci)	2012	2010	2008
BTH	Bigeye thresher	Zorro ojón	*Alopias superciliosus*	1	4	1
LMA	Longfin mako	Marrajo carite	*Isurus paucus*	2	6	6
SMA	Shortfin mako	Marrajo dientuso	*Isurus oxyrinchus*	3	2	2
POR	Porbeagle	Marrajo sardinero	*Lamna nasus*	4	10	7
FAL SA	Silky shark	Tiburón jaquetón	*Carcharhinus falciformis*	5	1	5
CCS	Night shark	Tiburón de noche	*Carcharhinus signatus*	6		
CCP	Sandbar shark	Tiburón trozo	*Carcharhinus plumbeus*	7		
OCS	Oceanic whitetip	Tiburón oceánico	*Carcharhinus longimanus*	8	5	4
FAL NA	Silky shark	Tiburón jaquetón	*Carcharhinus falciformis*	9	1	5
ALV	Common thresher	Zorro común	*Alopias vulpinus*	10	12	11
BSH NA	Blue shark	Tiburón azul - Tintorera	*Prionace glauca*	11	7	10
DUS	Dusky shark	Tiburón arenero	*Carcharhinus obscurus*	12		
SPK	Great hammerhead	Cornuda gigante	*Sphyrna mokarran*	13		
BSH SA	Blue shark	Tiburón azul - Tintorera	*Prionace glauca*	14	7	10
PST SA	Pelagic stingray	Raya	*Pteroplatytrygon violacea*	15	11	12
TIG	Tiger shark	Tintorera tigre	*Galeocerdo cuvier*	16		
SPL NA	Scalloped hammerhead	Cornuda común	*Sphyrna lewini*	17	9	9
SPZ	Smooth hammerhead	Cornuda cruz	*Sphyrna zygaena*	18	8	8
SPL SA	Scalloped hammerhead	Cornuda común	*Sphyrna lewini*	19	9	9
PST NA	Pelagic stingray	Raya	*Pteroplatytrygon violacea*	20	11	12

Vulnerability rank estimated for 16 species (20 stocks) of pelagic elasmobranchs.

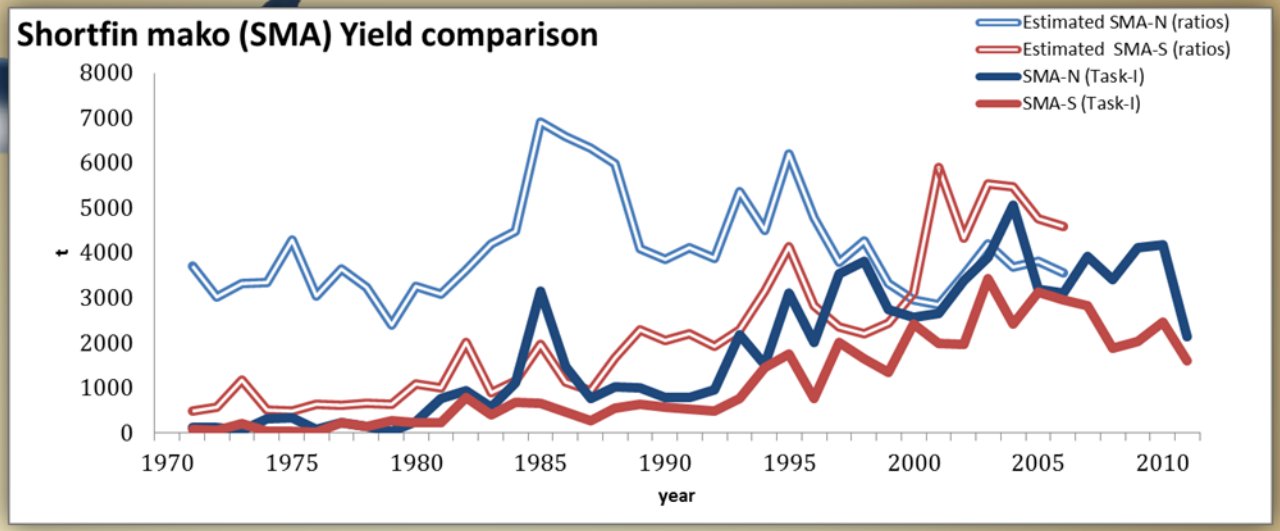
BSH: Blue shark

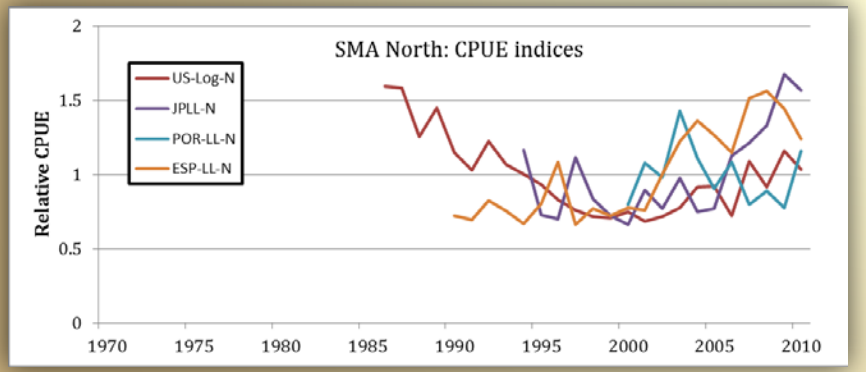
Blue shark		North	South
2007 Yield		61,845	37,075
Provisional Yield (2010)		37,238	27,729
Relative Biomass	B_{2007}/B_{MSY}	1.87-2.74	1.95-2.80
	B_{2007}/B_0	0.67-0.93	0.86-0.98
Relative Fishing mortality	F_{MSY}	0.15	0.15-0.20
	F_{2007}/F_{MSY}	0.13-0.17	0.04-0.09

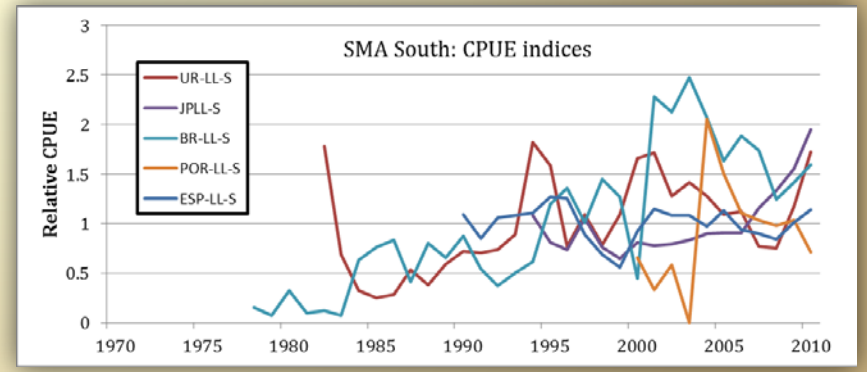




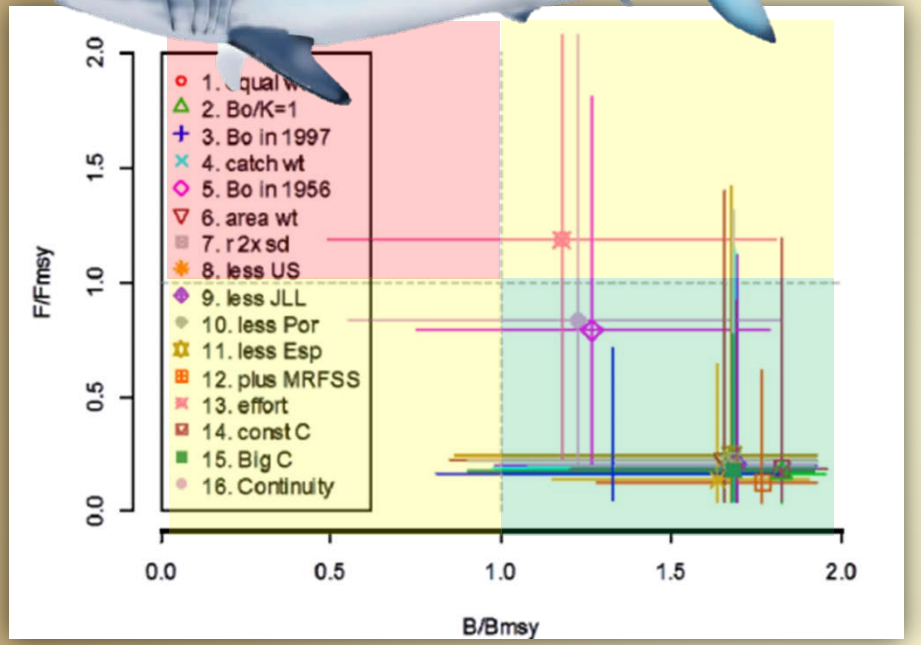
SMA: Short fin mako shark

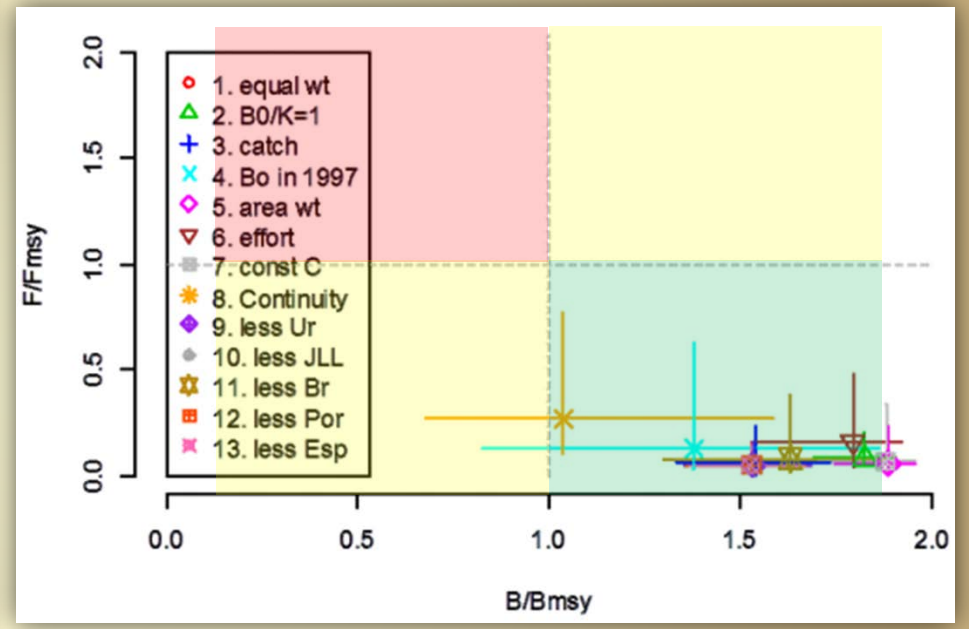




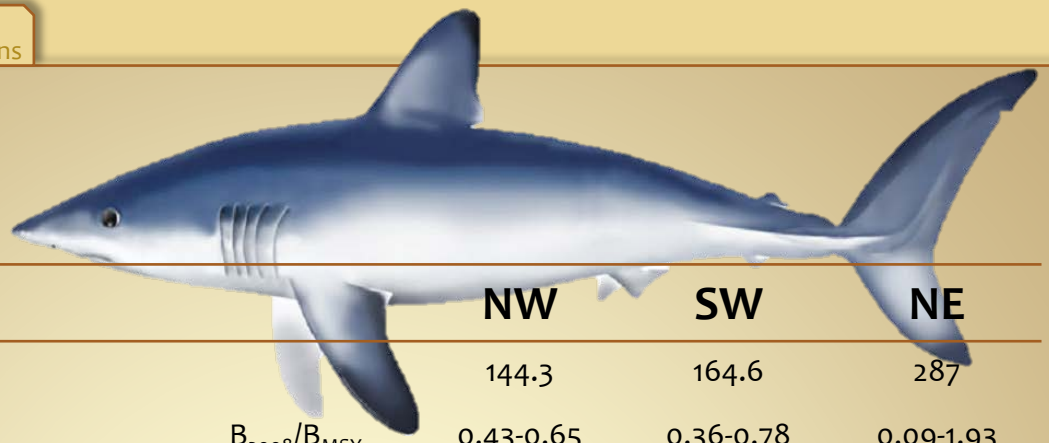


SMA: Short fin mako shark

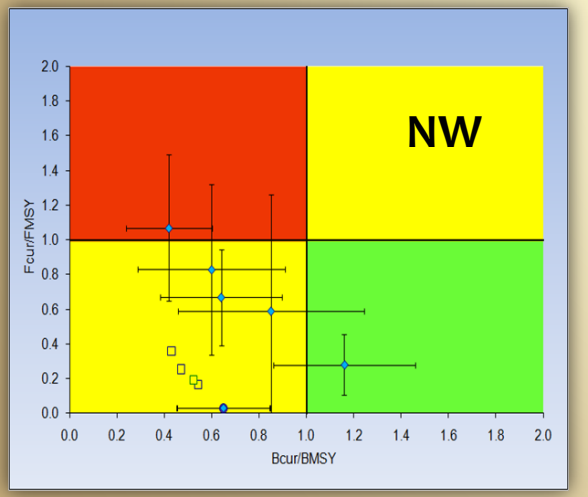


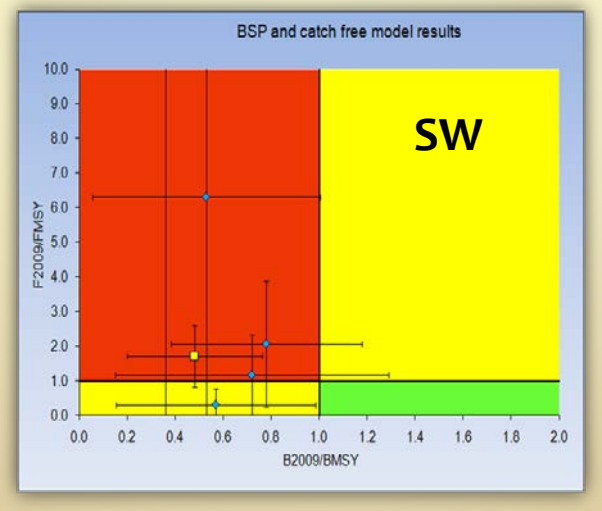


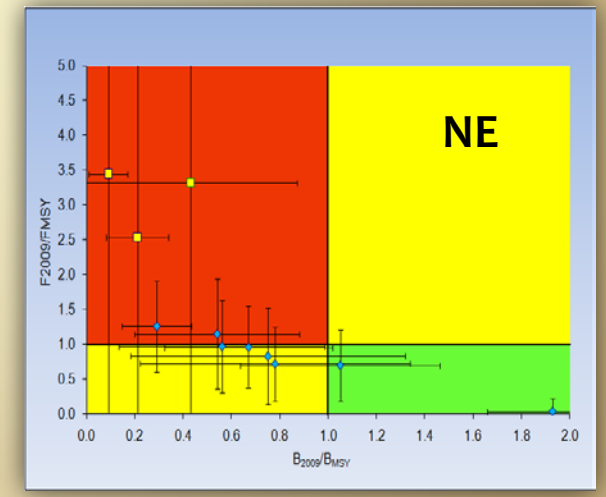
- Both the North and South Atlantic stocks are **healthy** and the **probability of overfishing is low.**
- **Inconsistencies** between estimated biomass trajectories and input CPUE trends, which resulted in wide confidence intervals.
- The **high uncertainty in past catch estimates** and **deficiency of some important biological parameters,** particularly for the southern stock, are still obstacles for obtaining reliable estimates of current status of the stocks.



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.

- The **SCRS welcomed the measures adopted by the COM** in the past three 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, hammerhead shark and silky shark).

Management recommendations

- CPCs provide the corresponding statistics of **all ICCAT and non-ICCAT fisheries capturing SHK,** including recreational and artisanal fisheries.

- **Joint work with the ICES Working Group on Elasmobranch Fishes** should be continued.

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

- CPCs explore methods to estimate catches of sharks in **purse seine and artisanal fisheries.**
  - Management measures should be applied to these sectors where catches of shark species are determined to be significant.
  - Methods for mitigating shark by-catch by these fisheries also need to be investigated and applied.

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 (Shortfin mako)

- Taking into consideration the continued high vulnerability ranking in the ERA, results from the modeling approaches used in the assessment, the associated uncertainty, and the relatively low productivity of shortfin mako sharks, the Committee recommends, as a precautionary approach, that **the fishing mortality of shortfin mako sharks should not be increased** until more reliable stock assessment results are available for both the northern and southern stocks.

Management recommendations

- To date, assessments have focused only on Atlantic stocks, and not on shark stocks in the Mediterranean Sea stocks.

- Nevertheless, it should be noted that **Mediterranean specific measures** relevant to sharks species of interest were adopted during 2012.

    - 10 elasmobranch(1) species were strictly protected under **Annex II of the Barcelona Convention** (under the Protocol Concerning Specially Protected Areas and Biological Diversity in the Mediterranean).
    - Under Annex II protection, these shark species can no longer be captured or sold, and plans for their recovery should be developed.

(1) These species include shortfin mako (*Isurus oxyrinchus*), porbeagle (*Lamna nasus*), smooth hammerhead (*Sphyrna zygaena*), scalloped hammerhead (*Sphyrna lewini*), great hammerhead (*Sphyrna mokarran*), and tope (*Galeorhinus galeus*).

Responses to Commission's requests

- 18.6 Analyze the potential benefits and applicability of the use of time/area closures as a tool for marlin conservation, Rec.[11-07] par. 4.
- 18.7 Evaluate the data collection improvement plans submitted by CPCs and, as necessary, make recommendations on how shark data collection can be improved, Rec.[11-08] par. 8.
- 18.9 Evaluate sea-turtles data provided by CPCs and by-catch mitigation information, Rec.[10-09].

18.6 Analyze the potential benefits and applicability of the use of time/area closures as a tool for marlin conservation, Rec.[11-07] par. 4.

- In general, time-area closures can be an **effective** fisheries management tool.
- The evaluation of time-area closure strategies should consider:
  - the potential **impacts on targeted catches**,
  - the effect of **effort shifted** elsewhere,
  - the ability of **monitor the compliance** with any measure, and
  - the anticipated effect on the **ability to monitor stock status**.
- The Committee was unable to fully address this issue in 2012 due to its focus on completing the WHM stock assessment. However, the Committee will in the **future** evaluate the available data and potential analyses in order to provide further guidance on this issue.

18.7	Evaluate the data collection improvement plans submitted by CPCs and, as necessary, make recommendations on how shark data collection can be improved, Rec.[11-08] par. 8.

- The Committee noted that few CPCs have submitted plans for improving their data collection for sharks on a species specific level.
- The Committee urges those CPCs that are required to submit such plans in accordance to Rec. [11-08] to do so as these plans are an essential element to improve the data needed to evaluate the status of the shark stocks.

18.9	Evaluate sea-turtles data provided by CPCs and by-catch mitigation information, Rec.[10-09].

- Information on turtle bycatch and bycatch mitigation measures was provided by CPCs and was evaluated by the SCRS. The Committee also reviewed available methodologies for assessing the impact of ICCAT fisheries on sea turtle populations.

- As directed by the Commission, the Committee plans to complete the analysis and prepare a response to the Commission in 2013.

P4 Research and Statistics

SWO

- Support the participation of **external experts** to assist to the stock assessment for North and South Atlantic Swordfish planned for 2013 (in line with [Res. 11-17] on Best Available Science.

- CPCs that can make valuable contributions to the assessments make the necessary arrangements to ensure the presence of their **national scientists** at those meetings.

BIL

- The Committee recommends that the Commission and all CPCs concerned reaffirm their commitments to Enhanced Billfish Research Program (**EBRP**) by funding the **2013 budget** in full.

SHK

- The Committee recommends developing a **Special Research Program** for sharks that focuses on the reduction of the major sources of uncertainty in formulation of scientific advice. The program will be defined in 2013 and included in the SCRS's strategic science plan envisaged for the period 2014-2020.

SC-ECO

- To expedite the completion of the **national observer program database and reporting forms,** the Committee recommends that a Call for Tender be developed to **hire a technical expert** to assist the Secretariat on a shortterm basis.
- Support the participation of **external experts** to assist the work of the Sub-Committee planned for 2013.

SMT

- The Committee recommends the establishment of an **ICCAT Year Research Programme for small tuna** species (SMTYP).
    - To improve the ICCAT database for small tunas (Task I and II), the poorest compared with all other species) and to make the assessment of these species possible in the next few years in the context of the precautionary and ecosystem approaches, there is an urgent need for the establishment of a 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: **2 years** (**95,000 €**)

SWO

- [Rec 11-03] does not correctly reproduce the weight conversion factors that have been adopted for the **Mediterranean stock** ; the SCRS recommends that the following phrase should be modified as follows: **"....weighing less than 10 kg of round weight or 9 kg of gilled and gutted weight, or 7.5 kg of dressed weight (gilled, gutted, fins off, part of head off)"**.

> 8. In order to protect small swordfish, CPCs shall take the necessary measures to prohibit the catching, retaining on board, transhipping, landing, transporting, storing, selling, displaying or offering for sale Mediterranean swordfish measuring less than 90 cm LJFL or, in alternative, weighing less than 10 kg of round weight or 9 kg of gutted weight, or 7.5 kg of gilled and gutted weight.

BIL

- Due to the misidentification problems the SCRS recommends 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.

SHK

- Considering the need to improve the stock assessments of pelagic sharks affected by the ICCAT fisheries, the Committee recommends that the CPCs provide **data** corresponding to all the **ICCAT and non-ICCAT fisheries** that catch these species, which also includes the artisanal and recreational fisheries.

SC-ECO

- Cooperation, including data exchange, between ICCAT and the Inter-American Convention for the Protection and Conservation of Sea Turtles (**IAC**) be strengthened by means of a **Memorandum of Understanding** between both organizations.

- The Committee encourages CPCs to conduct research on **sea turtle population genetics**.