Science, Service, Stewardship

Presentation of SCRS Meeting Results and Advice

IAC, October 2011

NOAA FISHERIES SERVICE

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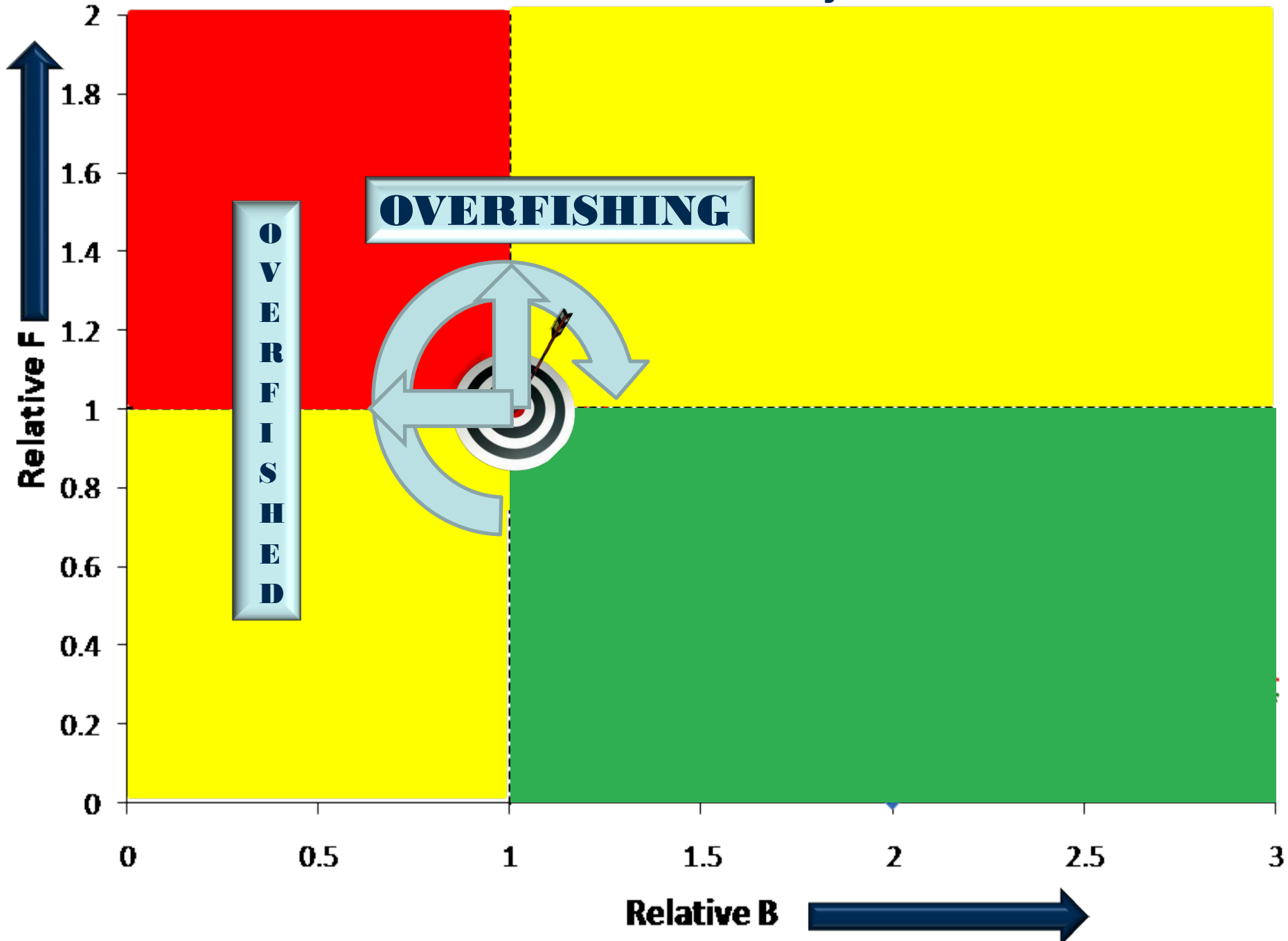
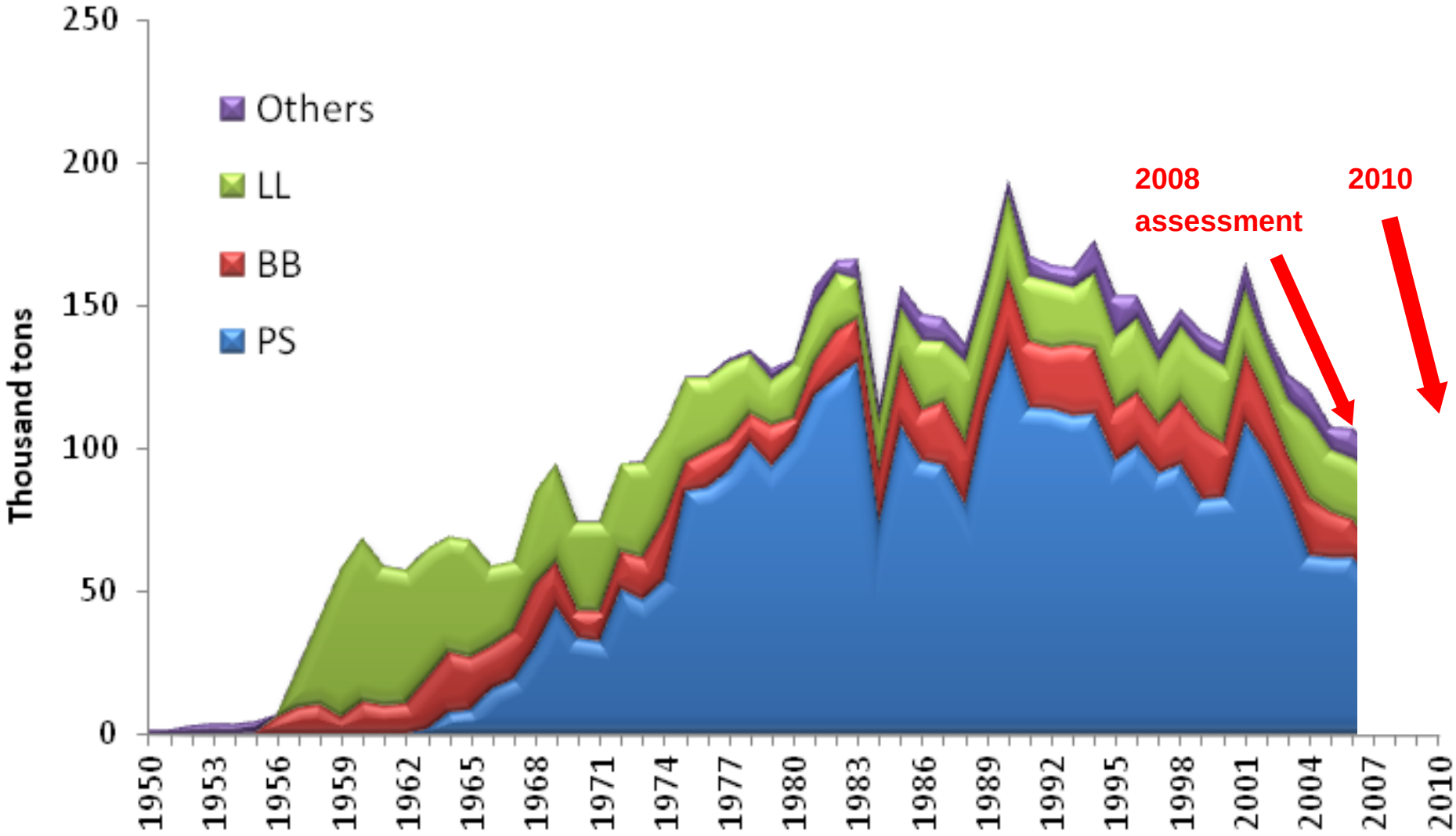
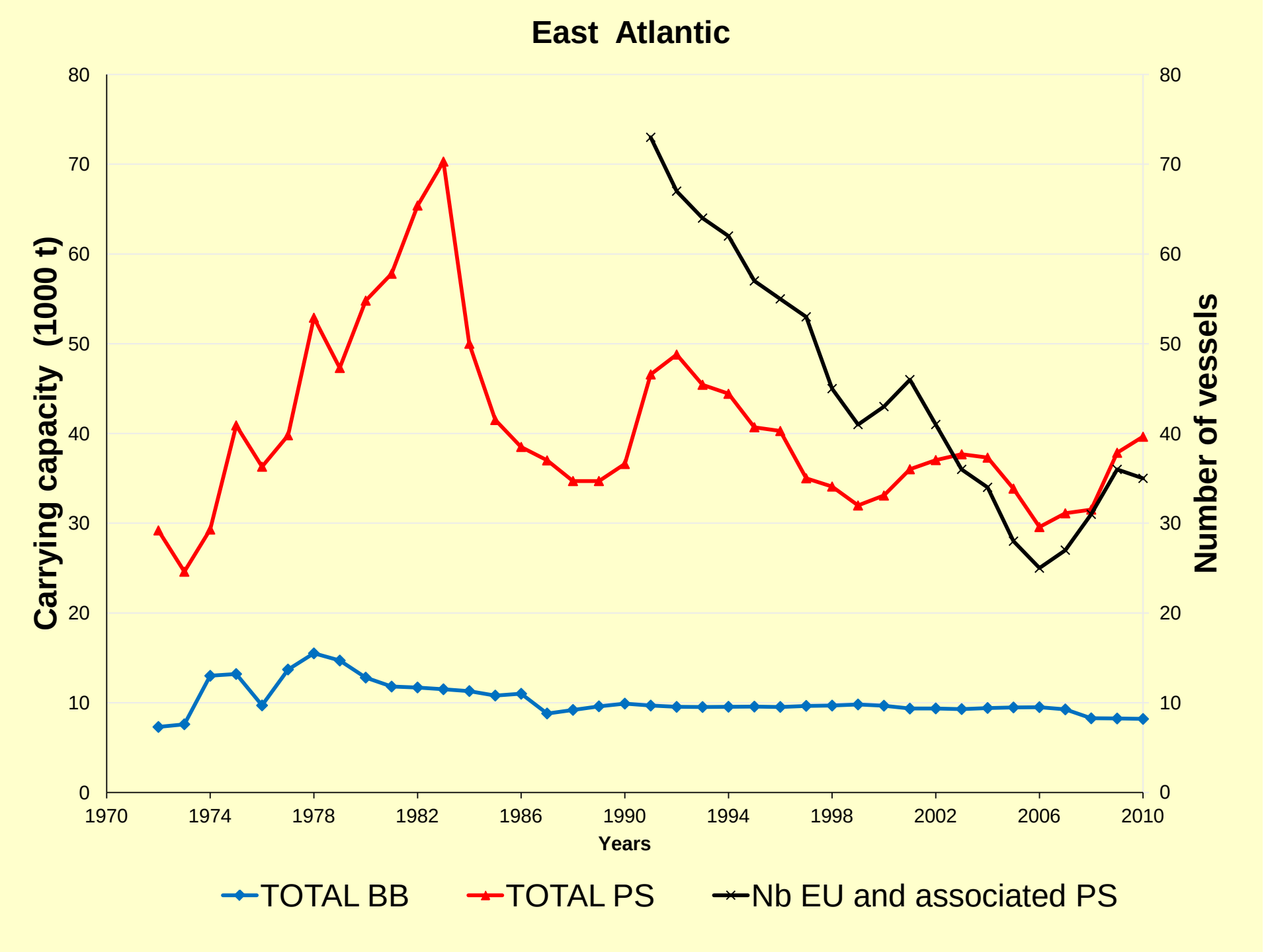
Bigeye, Albacore, Yellowfin and Skipjack (BAYS) Tunas Working Group

Stock Status Trajectories YFT

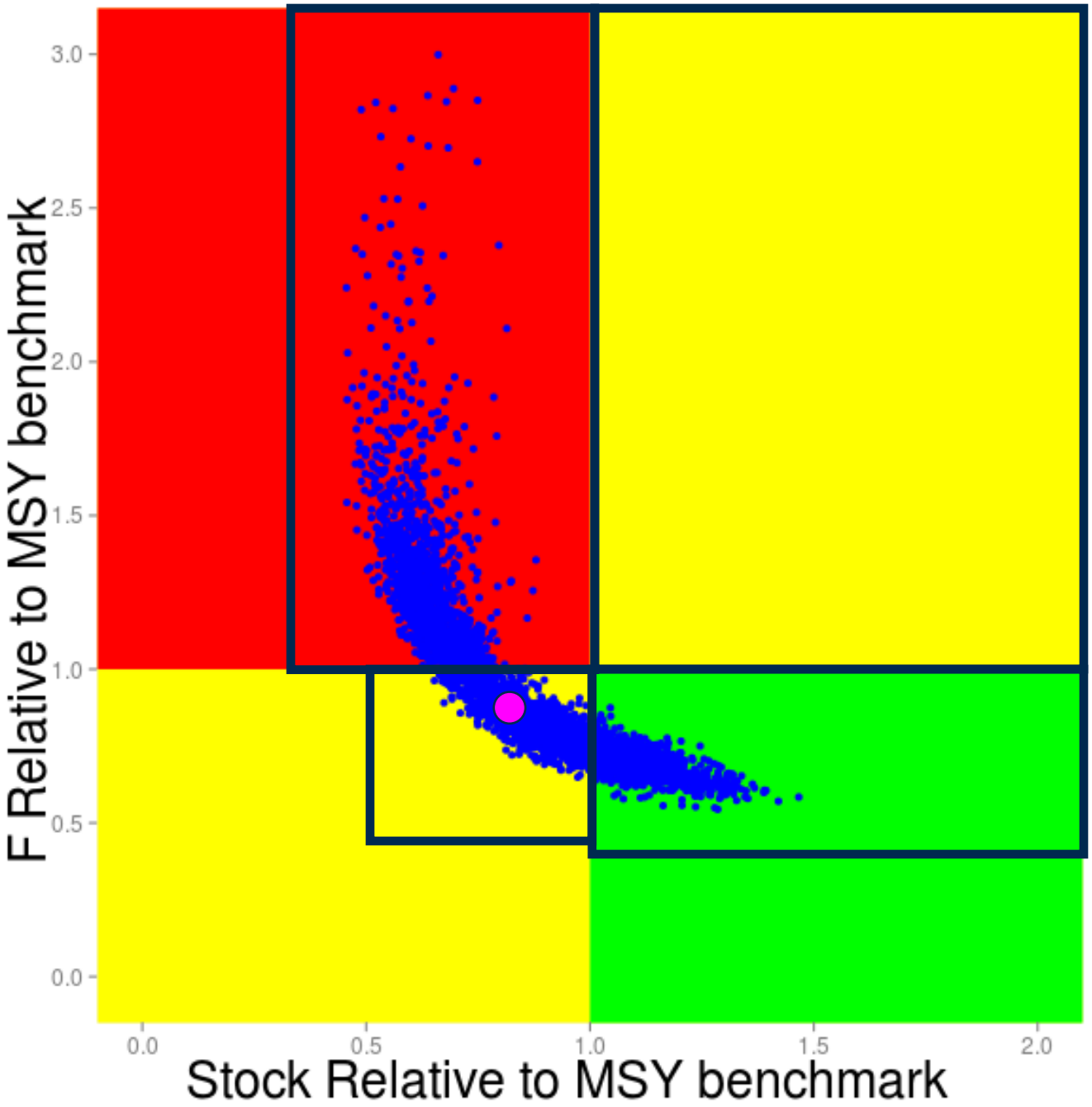


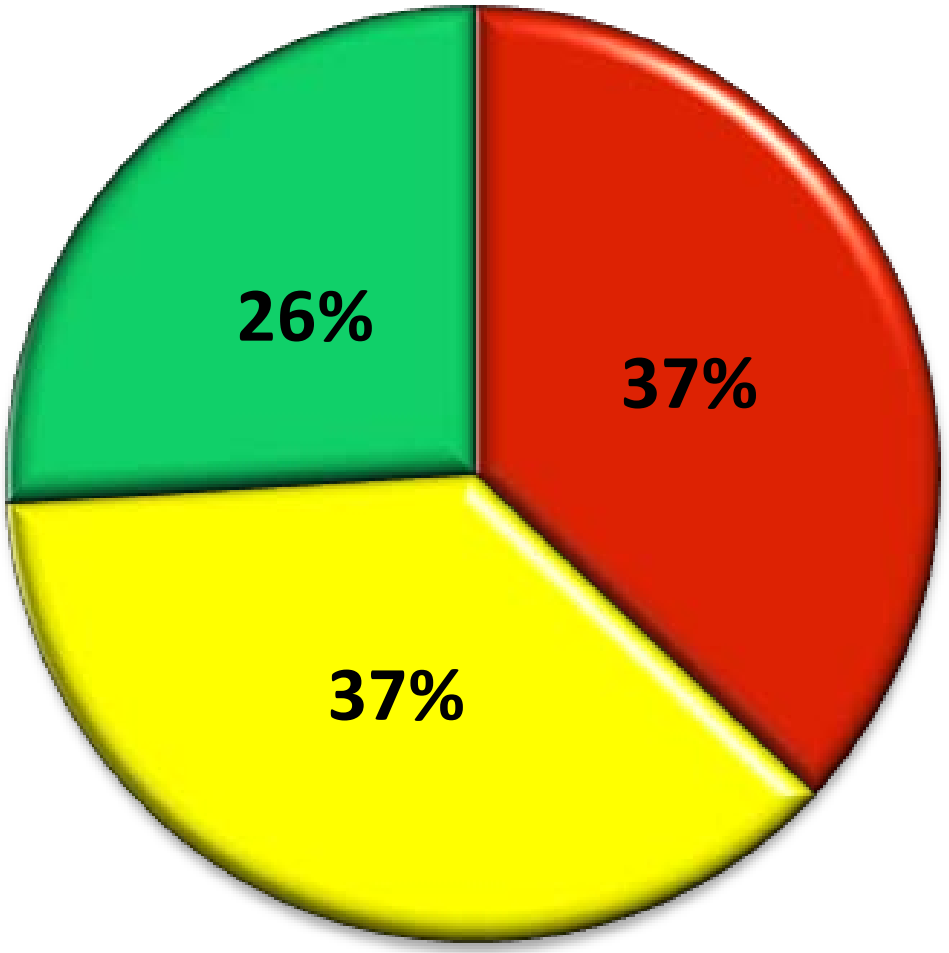
YFT


Thousand tons
250
200
150
100
50
0
Others
LL
BB
PS
2008 assessment
2010
1950
1953
1956
1959
1962
1965
1968
1971
1974
1977
1980
1983
1986
1989
1992
1995
1998
2001
2004
2007
2010


East Atlantic
Carrying capacity (1000 t)
Number of vessels
Years
0
10
20
30
40
50
60
70
80
1970
1974
1978
1982
1986
1990
1994
1998
2002
2006
2010
TOTAL BB
TOTAL PS
Nb EU and associated PS

Current Stock Status




26%
37%
37%
overfished and overfishing
overfished
neither overfished nor overfishing

ATLANTIC YELLOWFIN TUNA SUMMARY

Maximum Sustainable Yield (MSY)		144,600[1] (114,200 - 155,100)
2010 Yield [2]		108,343 t
Relative Biomass	B_{2010}/ B_{MSY}	**0.85 (0.61-1.12)[3]**
Relative Fishing Mortality: $F_{current(2010)}/F_{MSY}$		**0.87 (0.68-1.40)[3]**

Management measures in effect:

- Effective fishing effort not to exceed 1992 level [Rec. 93-04].

NOTE: $F_{current(2010)}$ refers to F_{2010} in the case of ASPIC, and the geometric mean of F across 2007-2010 in the case of VPA. As a result of the constant trend in recruitment estimated by the VPA model, F_{MAX} is used as a proxy for F_{MSY} for VPA results. Relative biomass is calculated in terms of spawning stock biomass in the case of VPA and in fishable biomass in the case of ASPIC.

[1] Estimates (with 80% confidence limits) based upon results of both the non-equilibrium production model (ASPIC) and the age-structured model (VPA).

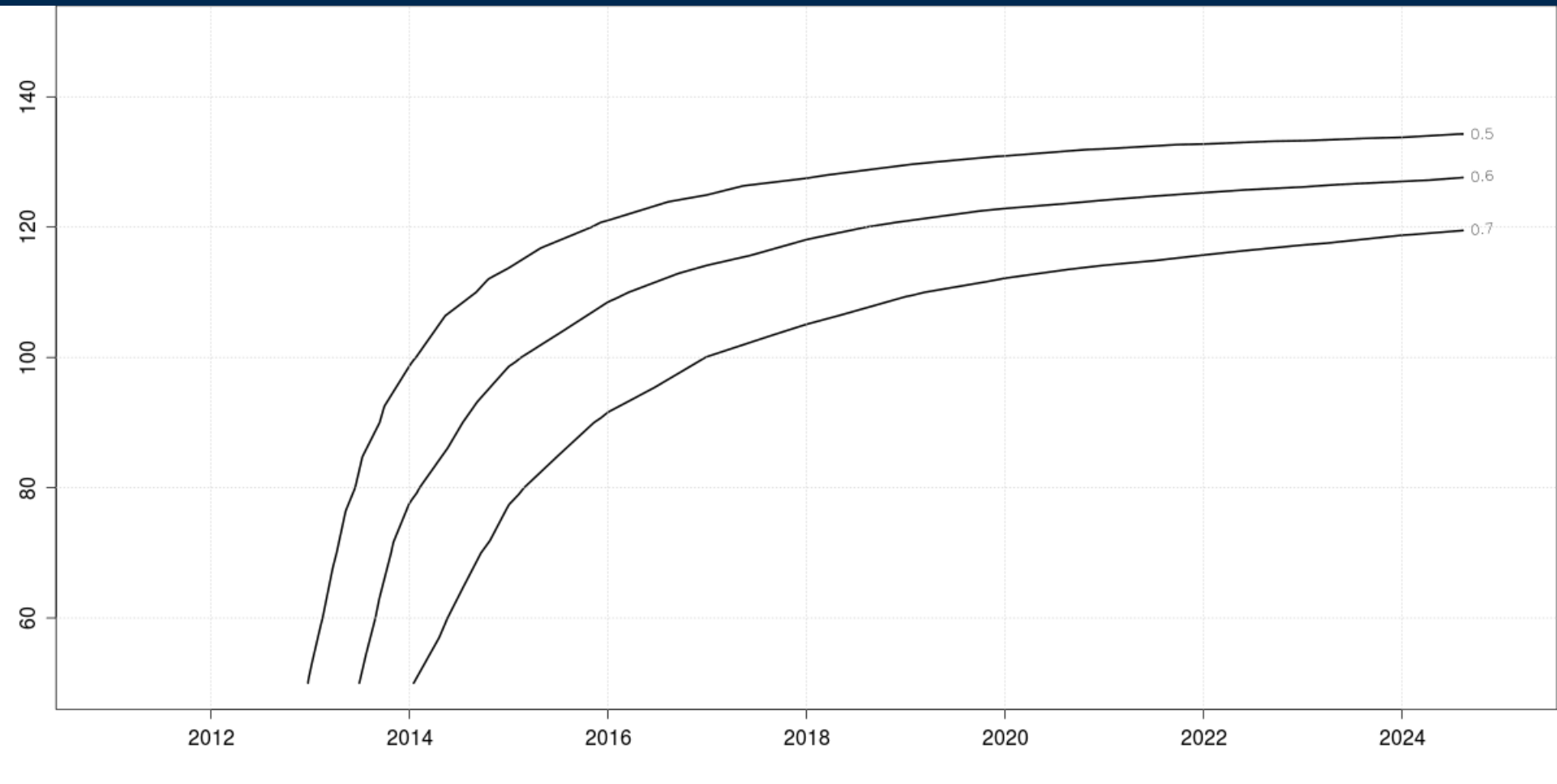
[3] The assessment was conducted using the available catch data through 2010.

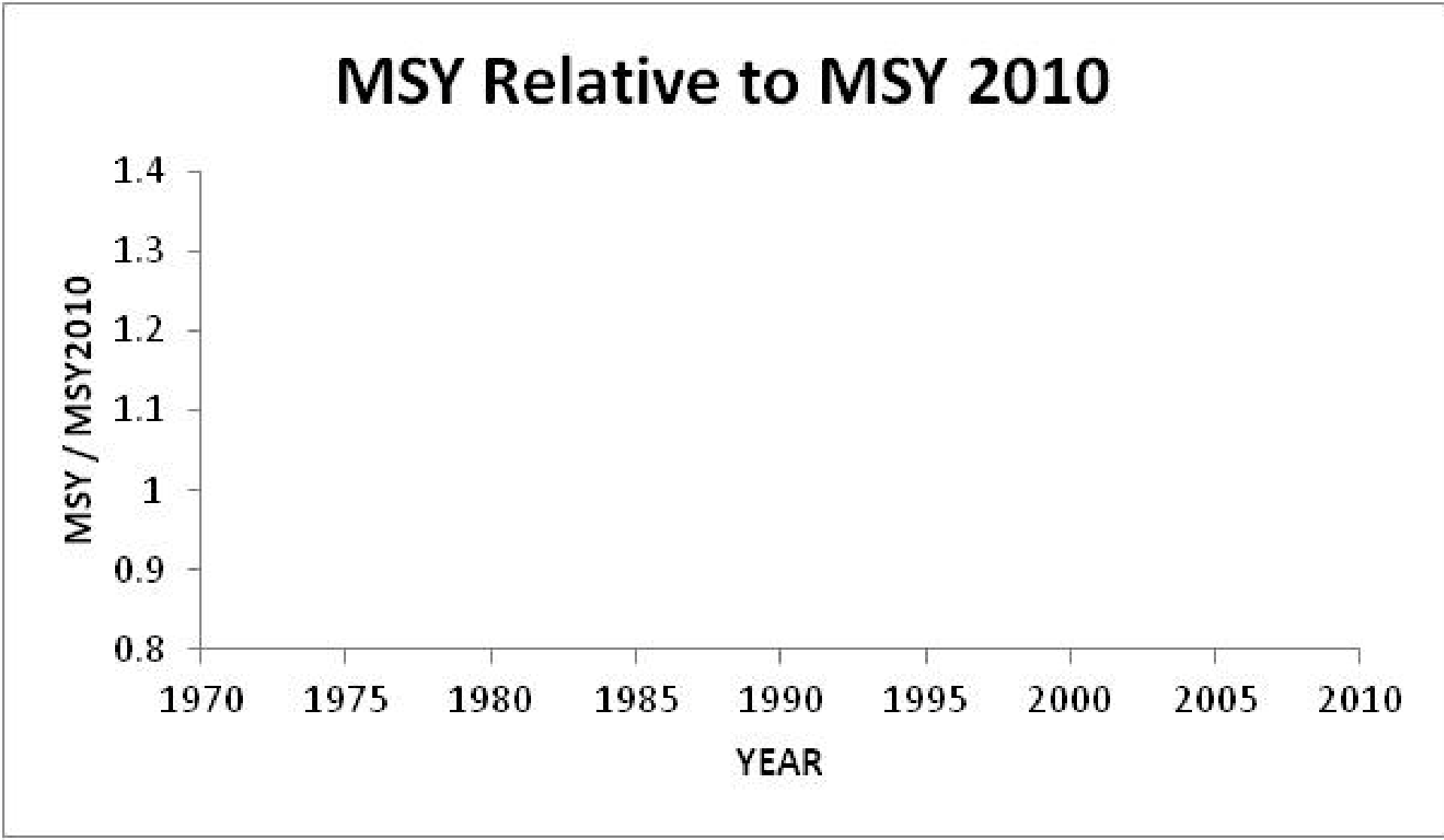
[4] Median (10^{th}-90^{th} percentiles) from joint distribution of age-structured and production model bootstrap outcomes considered.

Kobe II matrices giving the probability that the biomass will exceed the level that will produce MSY and the fishing mortality will fall below the fishing mortality rate that would maintain MSY, in any given year, for various constant catch levels based on combined model results.

Constant Catch (t)	Probability (%) that $B>B_{MSY}$ and $F<F_{MSY}$ in each year													
	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
50	25	51	70	78	84	87	89	91	92	93	94	95	95	96
60	24	48	66	76	81	85	87	89	90	92	93	93	94	94
70	24	45	63	73	78	82	85	87	89	90	90	92	92	93
80	24	43	59	69	75	79	82	84	86	87	88	89	90	90
90	24	40	54	65	71	75	78	81	82	84	85	86	87	88
100	24	37	49	59	66	70	73	76	78	80	81	82	83	84
110	23	35	45	53	59	64	67	70	72	74	75	76	77	78
120	23	32	40	46	51	55	58	61	64	65	66	68	69	70
130	23	29	35	39	43	45	47	49	51	53	54	55	56	58
140	22	26	29	31	33	34	36	36	37	38	39	39	40	40
150	20	21	22	22	22	21	21	21	21	21	21	21	20	20

Probability plot based on Kobe II matrices giving the probability that the biomass will exceed the level that will produce MSY and the fishing mortality will fall below the fishing mortality rate that would maintain MSY, in any given year, for various constant catch levels based on combined model results.

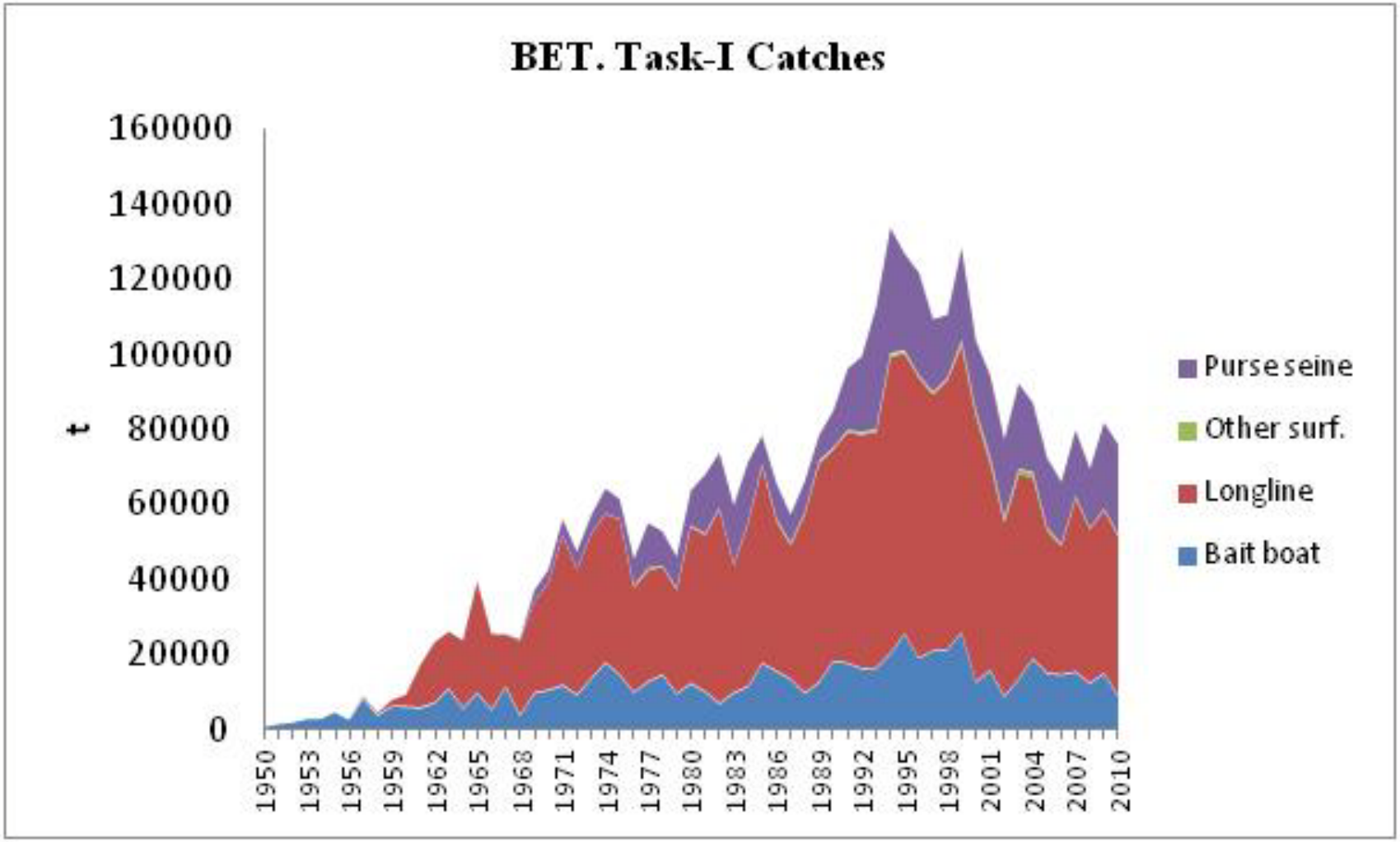



MSY Relative to MSY 2010
MSY / MSY2010
1.4
1.3
1.2
1.1
1
0.9
0.8
1970
1975
1980
1985
1990
1995
2000
2005
2010
YEAR

Best estimates (obtained in 2010) of status of BET suggest the stock and fishery are close to the convention's objectives

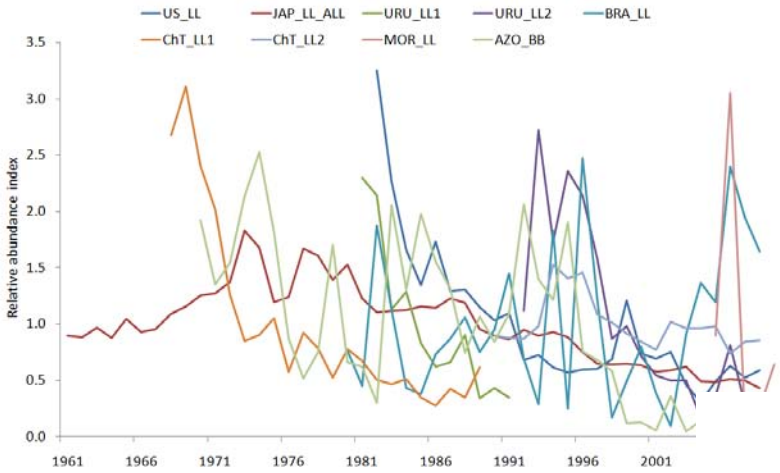
There are large uncertainties in the estimates of the assessment bench

ATLANTIC BIGEYE TUNA SUMMARY	
Maximum Sustainable Yield	78,700-101,600 t (**median 92,000 t**) [1,2]
Current (2010) Yield[1]	**75,783 t**[2,3]
Replacement Yield (2011)	64,900 – 94,000 (**median 86,000 t**) [1,2]
Relative Biomass (B_{2009}/B_{MSY})	0.72-1.34 (**median 1.01**) [1,2]
Relative Fishing Mortality F_{2009}/F_{MSY}	0.65-1.55 (**median 0.95**)[1,2]



2010 (preliminary) catch 75,783 t

Relative abundance indices

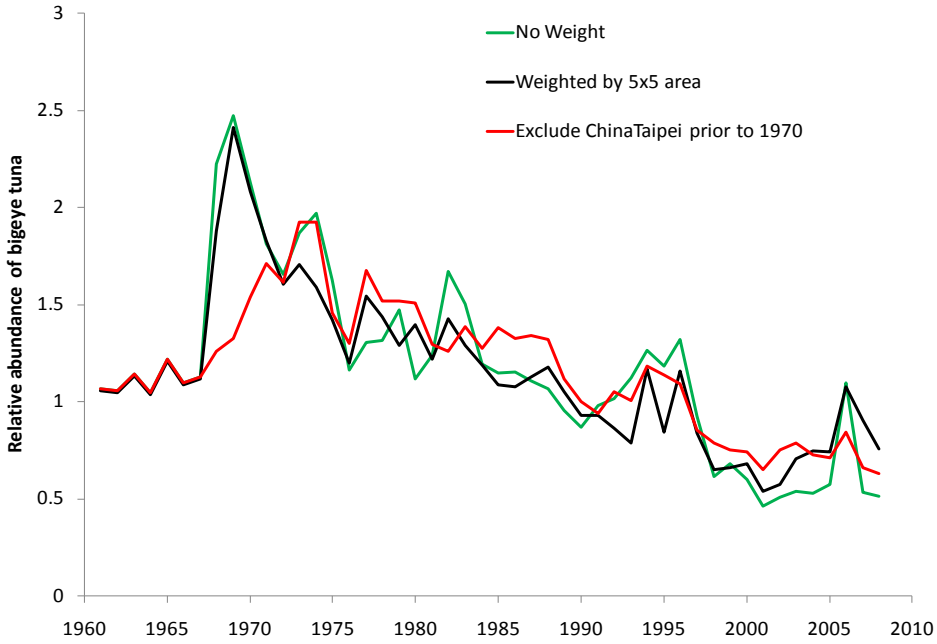


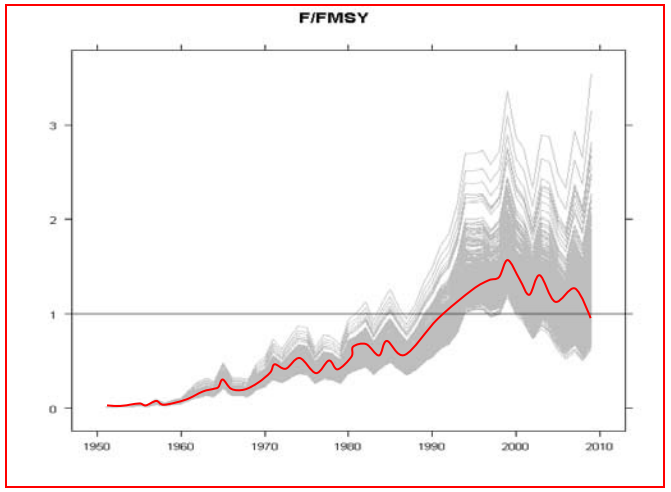
6 from longline fleets

and 1 from Baitboat fleet

3 different

combined indices



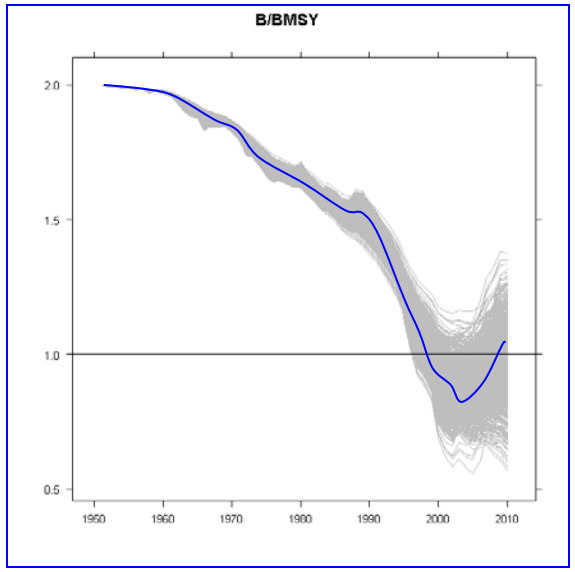


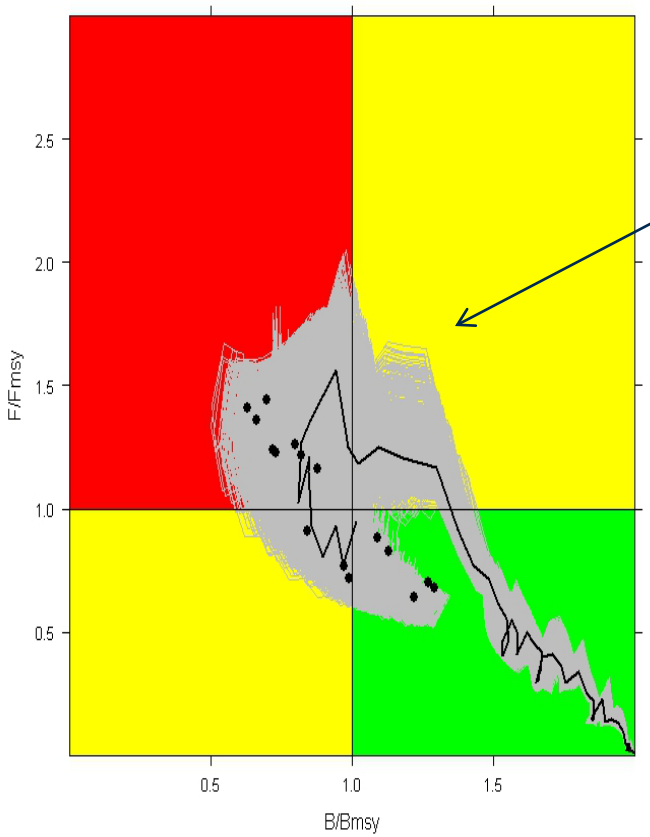
There is considerable uncertainty

in the assessment of stock status and productivity for bigeye tuna

as seen from Kobe plot

F/F_{MSY} and B/B_{MSY} estimated from the logistic production model





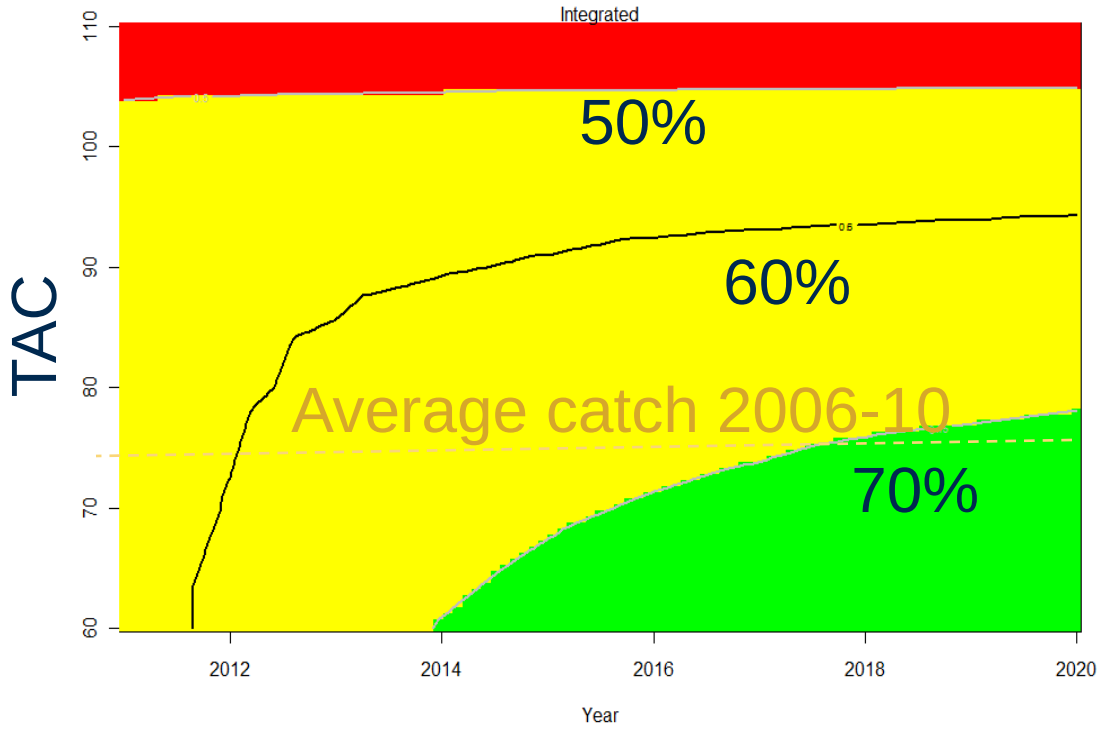
terminal year status (black dots) from all other models considered in the assessment.

KOBE plot matrix

Probabilities of the stock being above B_{MSY} and fishing at levels below F_{MSY}

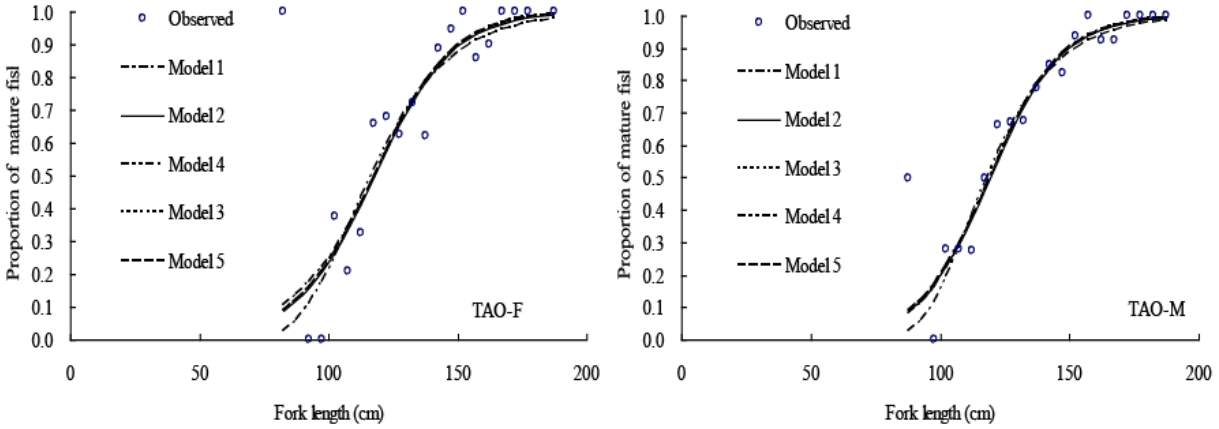
in a given year

for a future constant catch (TAC)



Projections were calculated from results of the combination of the three logistic production model runs used as the basis of the assessment

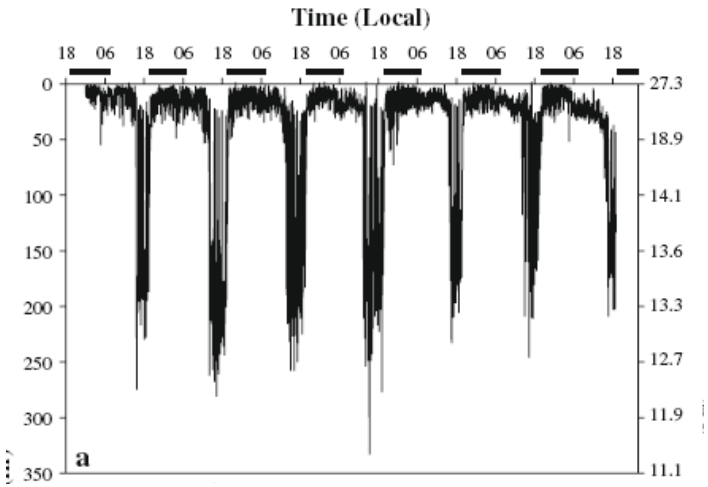
Some important updates on biological information



Broaden geographical/fleet coverage of reproductive samples and confirmed maturity ogives and length at maturity parameters

Guo Ping et al 2011

Confirmation that diurnal migration is exhibited by juveniles and adults in the ETP. This is relevant to management of fishing impacts on juveniles in all oceans.



Schaefer and Fuller 2010

Conclusions

- Significant uncertainties remain in the assessment, partially because of data limitations

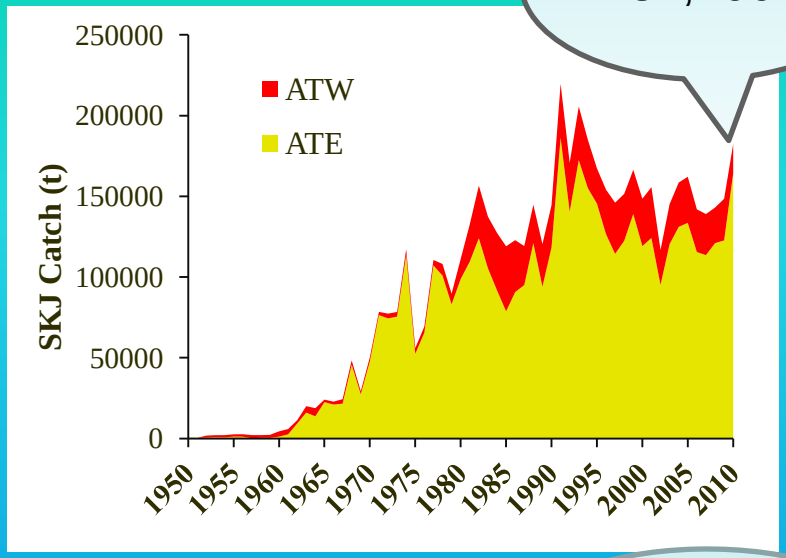
- Biomass end of 2009 close Bmsy

- Fishing mort. in 2009 close to Fmsy

- Recent catches have been at levels that should allow the stock to remain at levels that are consistent with the objectives of the Commission. Recent catch, however, may have been underestimated (because of unreported purse seine catches from Ghana and other).

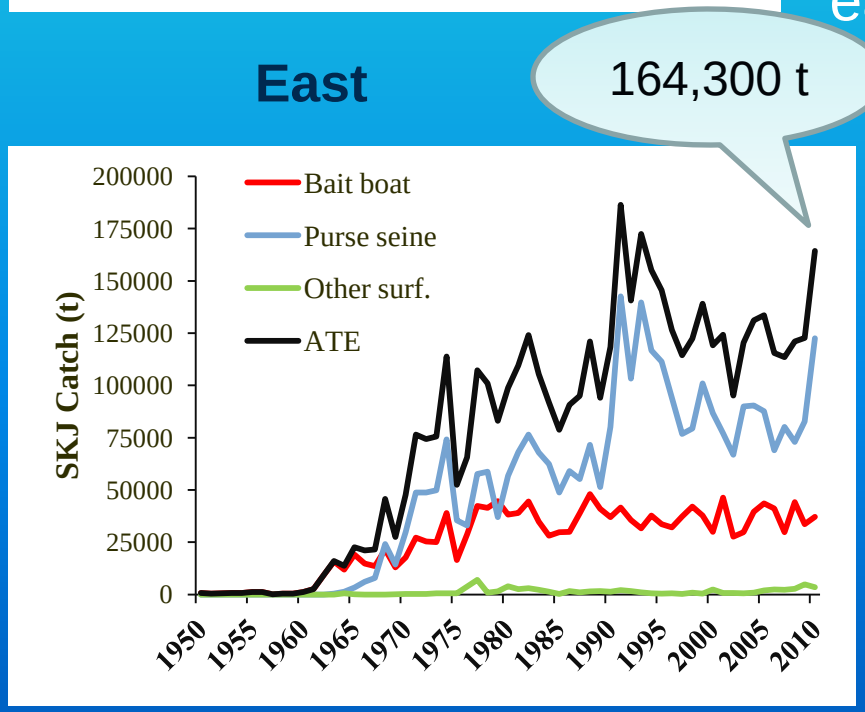
- Outlook "*cautiously optimistic" because of the amount of uncertainty in the assessment.*

Atlantic-wide

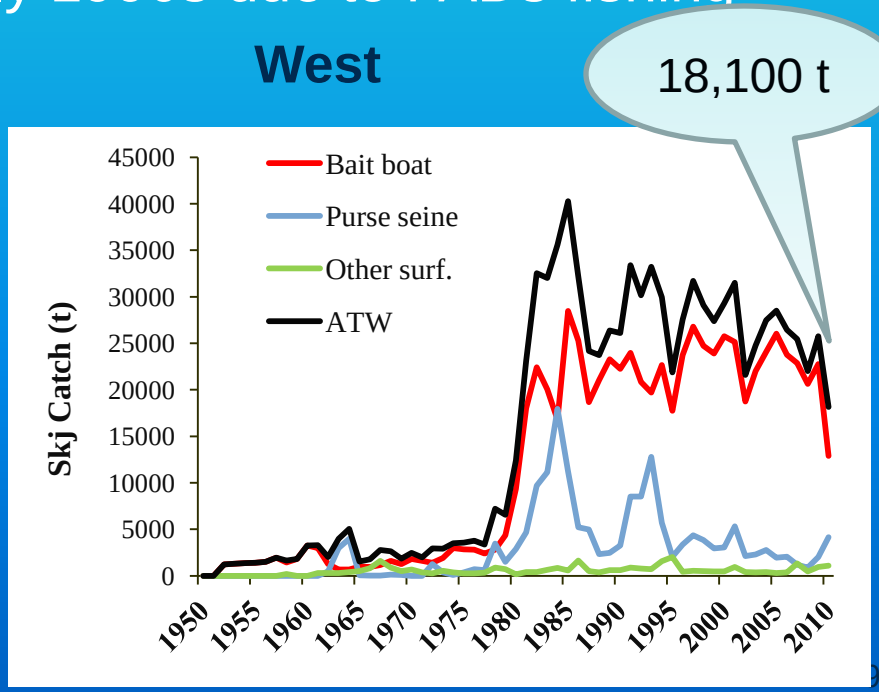


- Decline in catch since the early 1990s (due to a decrease in nominal fishing effort and/or to a moratorium effect), followed by a new increase in the recent years
- Catchability of SKJ increased in the early 1990s due to FADs fishing

East

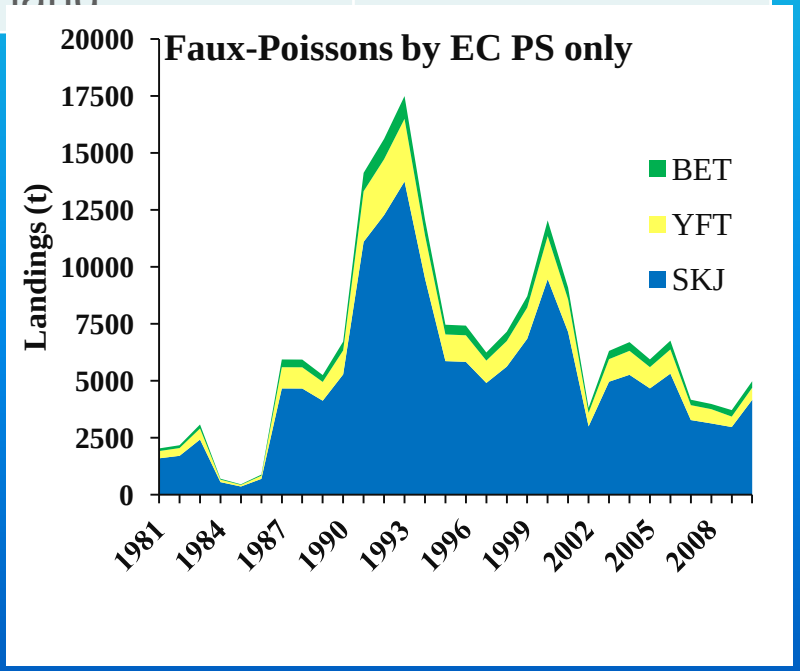


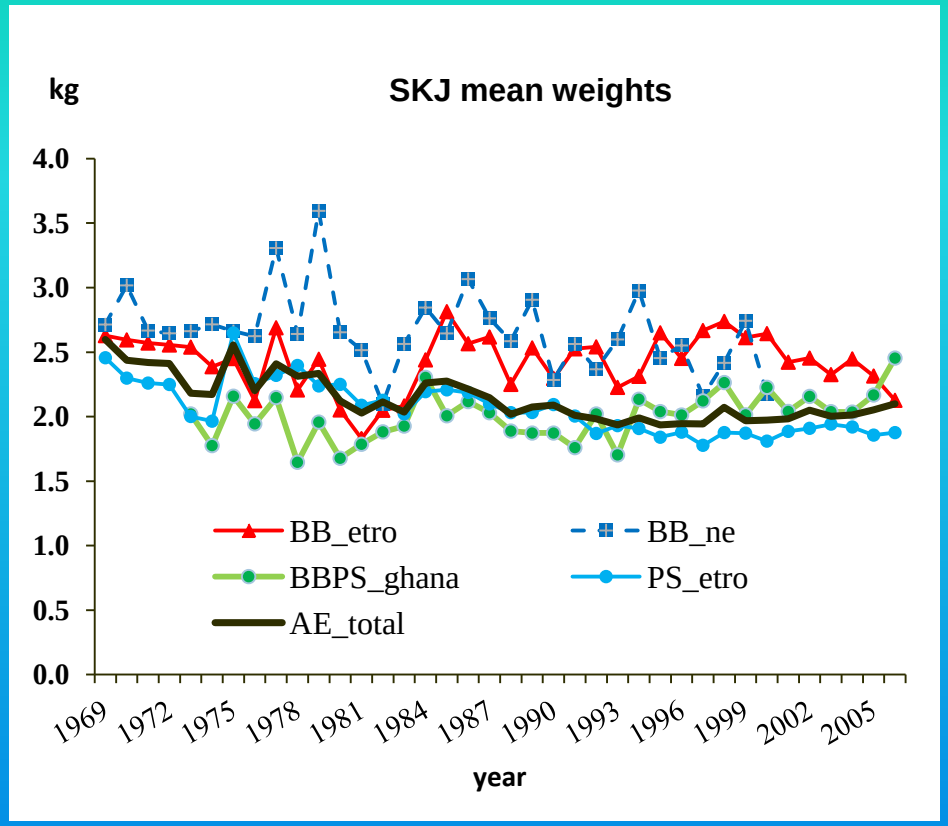
West



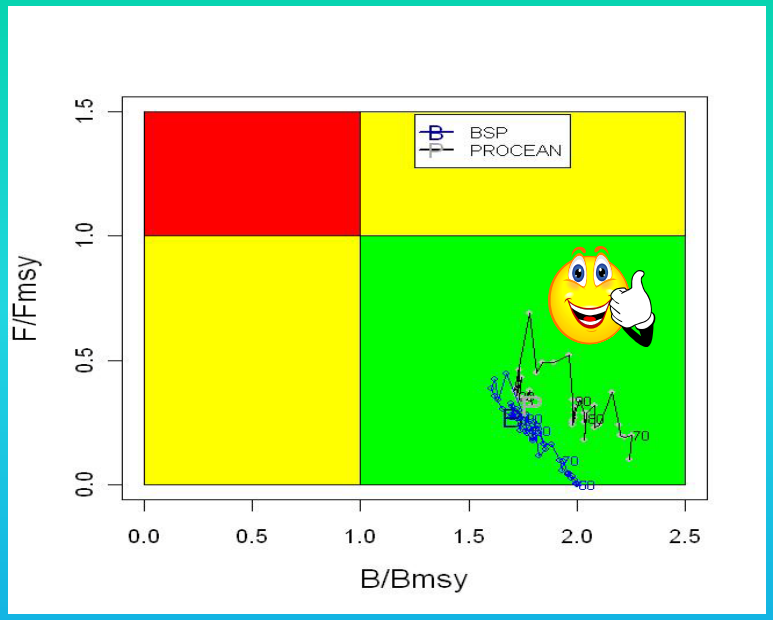
Estimates obtained for the unreported small skipjack landed in the local market of Abidjan in Côte d'Ivoire

Discards	"Faux-Poissons"
42 kg/t skj land	235 kg/t skj land.





Regular decrease in mean weight of SKJ (dominated by PS catches) until 1995



State of the Eastern Atlantic SKJ

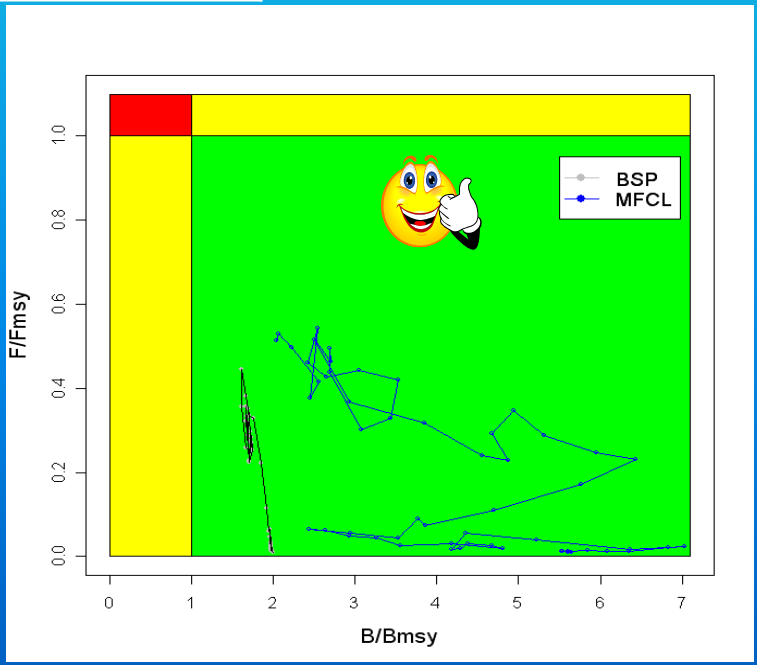
(conducted in 2008 with fisheries information until 2006)

Model type	MSY
RRIC (G & G index)	149,000 t
Catch only model (Schaefer form)	143,000 t -156,000 t
Procean (Generalised form)	155,000 t– 170,000 t
BSP (Schaefer form)	155,000 t– 170,000 t
Current Catch	**164,000 t**
Average recent catches (5 years)	121,000 t

Model type	MSY
RRIC (G & G index)	30,000 t
Catch only model (Schaefer form)	30,000 t
MULTIFAN-CL	31,000 t– 36,000 t
BSP (Schaefer form)	34,000 t
Current Catch	**18,000 t (incomplete)**
Average recent catches (5 years)	26,000 t

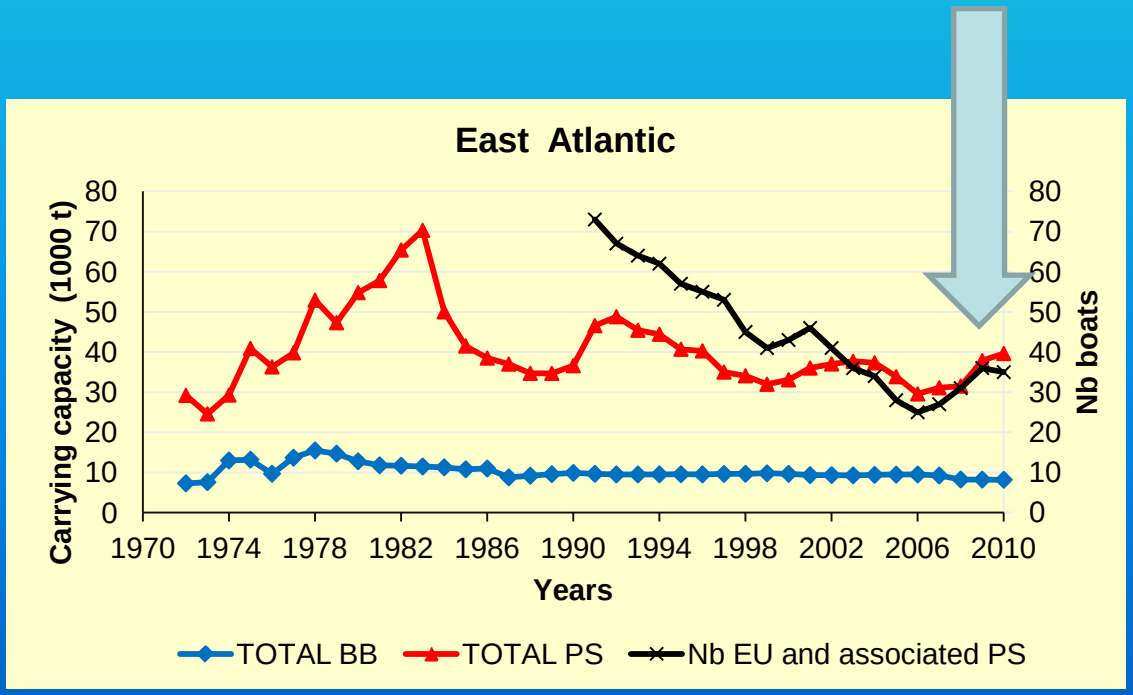
State of the Western Atlantic SKJ

(conducted in 2008 with fisheries information until 2006)



In conclusion, the status of each SKJ stocks looks in apparent good condition, but :

After a period of decline in nominal fishing effort, the situation changes after 2006 with the relocation of some purse seiners from the Indian Ocean to the eastern Atlantic



Until now, no evidence of a dramatic impact on the resource, but likely non-reported catches from some other new PS fleets …..

Tropical Tunas Work Plan for 2012

- **No stock assessment(s) are planned for yellowfin tuna, bigeye tuna or skipjack tuna in 2012.**

- **Update the fishery indicators for all three stocks in 2012.**

- **Revise biological parameters for the three species. National scientists should carry out studies on biological parameters (reproduction, maturity, length-weight relationships, growth, etc.).**

- **Evaluation of alternative methods for estimation of catch at age inferred from catch at size need to be conducted.**

- ***Problems were identified concerning standardized CPUE series for some fleets, which results in uncertainties in the assessment. Stock assessments rely heavily upon CPUE data, and, their representativeness as indices of abundance is of concern. Therefore, it is recommended to (in an intersessional meeting in 2012):***

a) Explore methods to combine the data from different fisheries in a single longline index.

b) Explore methods to improve and combine the indices provided from different fisheries in a single combined index.

Tropical Tunas Work Plan for 2012 (cont.)

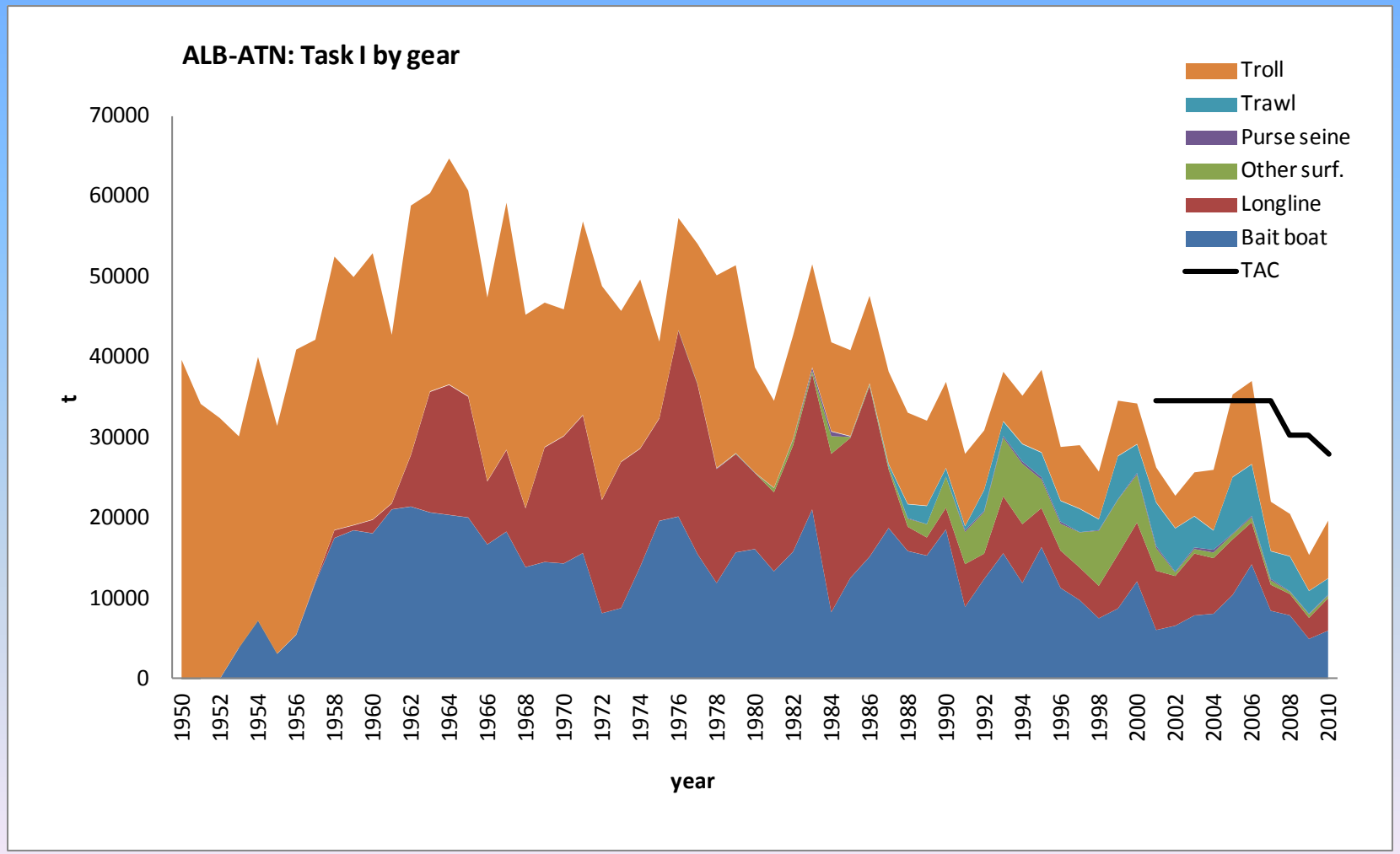
- **Stock assessments lack information on abundance of recruits and juveniles. Obtaining a better understanding of the factors that affect CPUE in purse seine (FADs, echo-sounders, satellites, etc.) and baitboat fisheries (FADs, schools associated with BB) and subsequent development of standardized abundance indices could result in improvements of the use of these data in stock assessments.**

  It was noted that ISSF will hold a workshop on this very topic in March 2012. The Committee expressed support for the workshop and encourages ICCAT scientists to participate since it will contribute to the goals of the inter-sessional meeting.

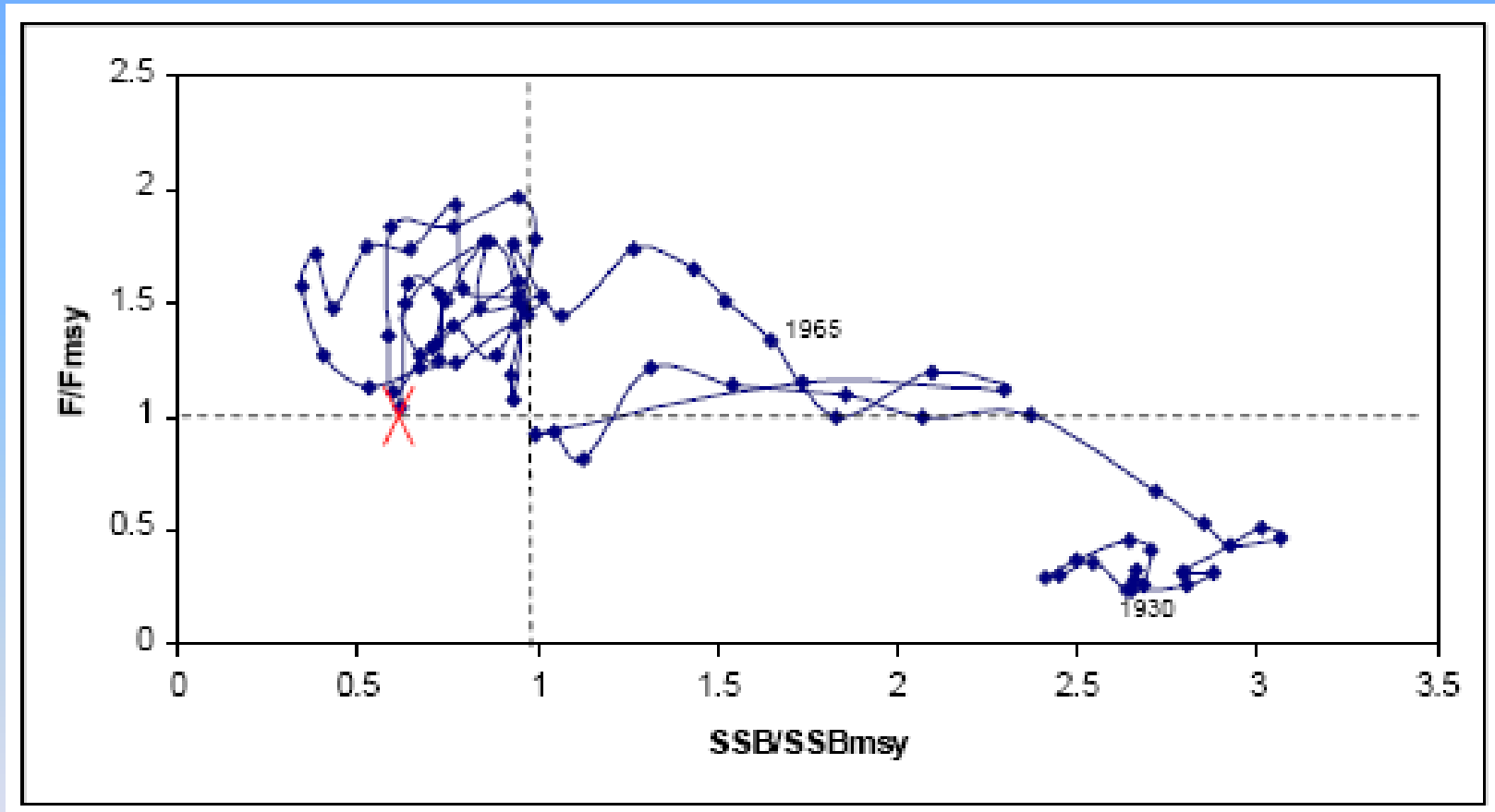
- **It is noted that the Methods Working Group is looking at methods to develop procedures for select indices that are suitable for each assessment method. It is of interest of the Tropical Working Group to participate in their work.**

Albacore Fisheries

Task I catch. North Atlantic stock



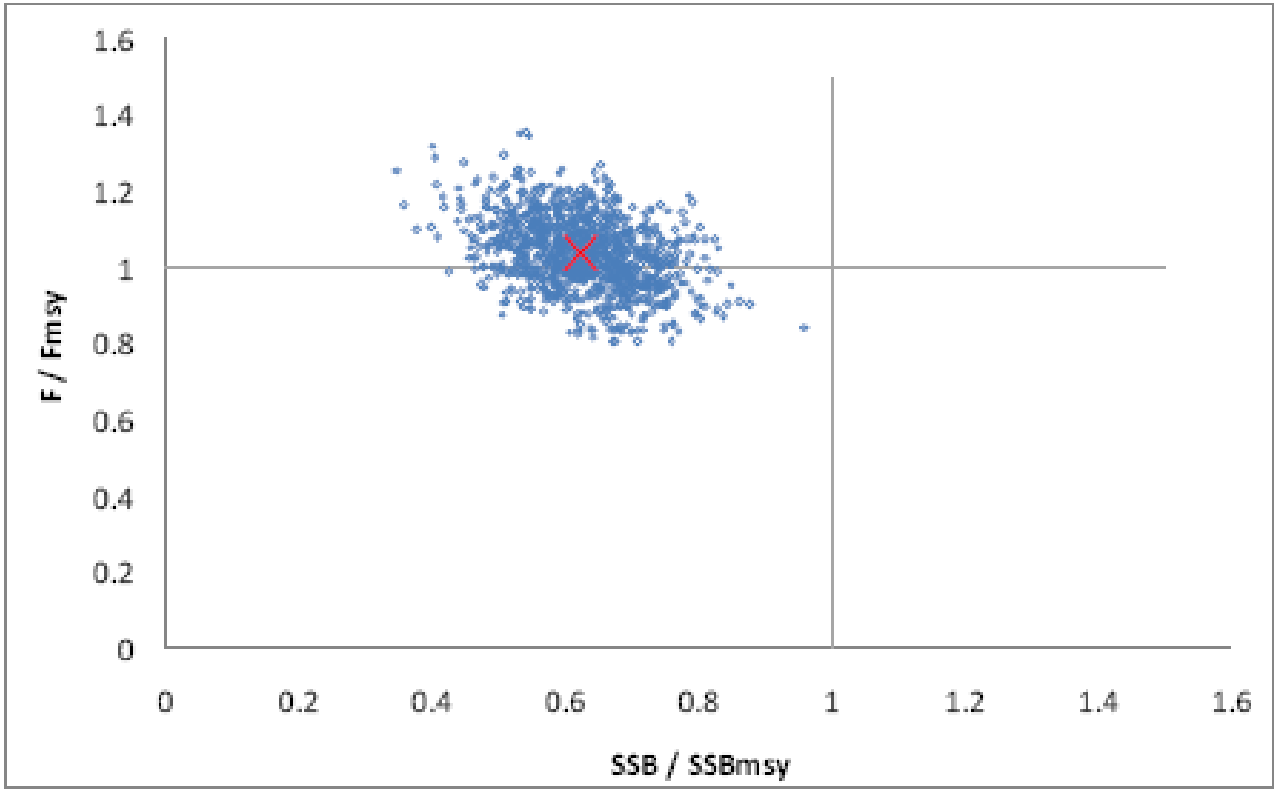
ALB- N- Relative F, SSB and status stock relative to MSY- MFCL base model 2009



2007 status $F_{2007}/Fmsy = 1.045$

$SSB_{2007}/SSBmsy = 0.62$

ALB- N- Relative F, SSB and status stock relative to MSY- MFCL base model

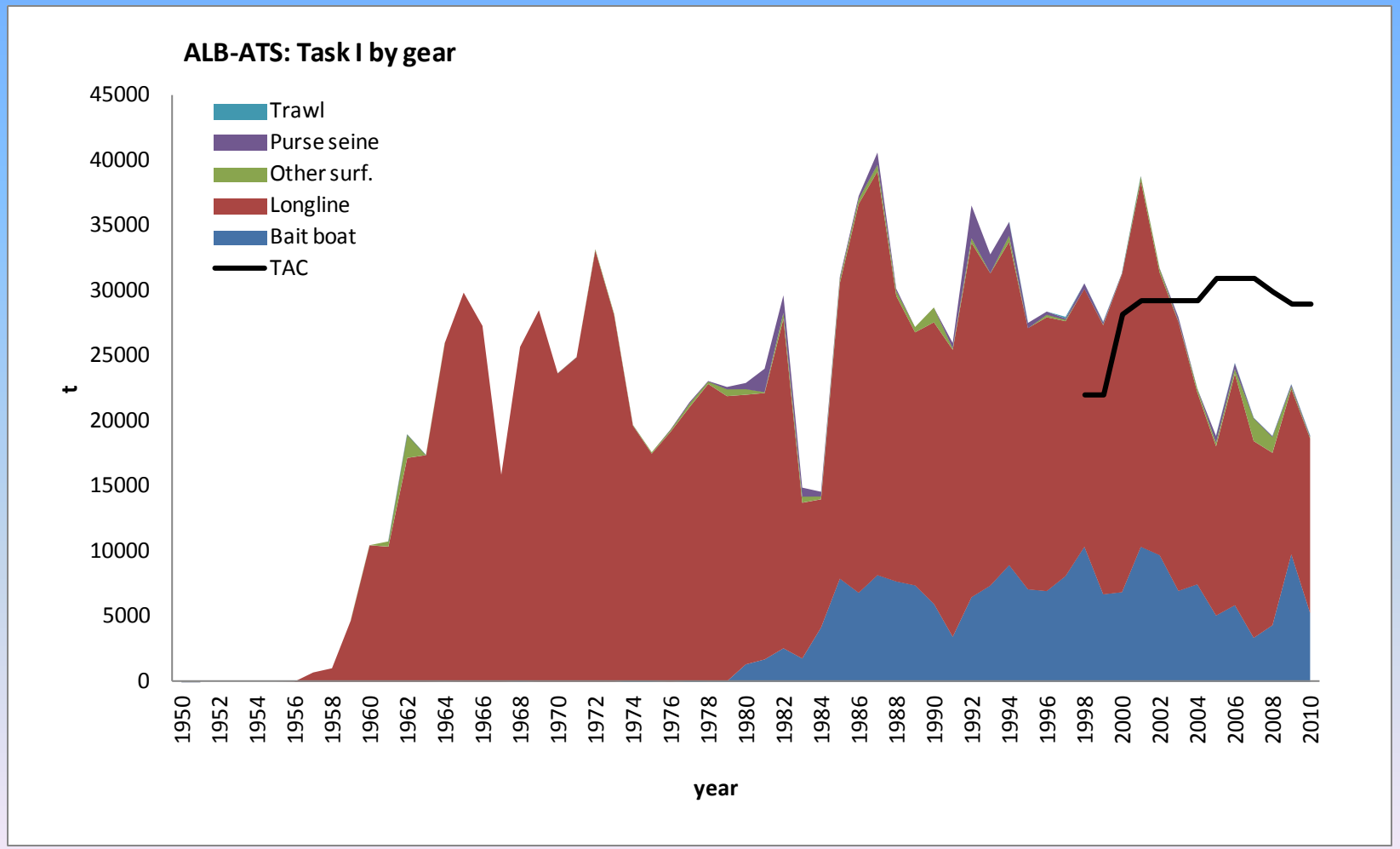


Uncertainty in current stock status for northern albacore 2007 status

F_{2007}/Fmsy = 1.045 ， SSB_{2007}/SSBmsy = 0.62

Albacore Fisheries

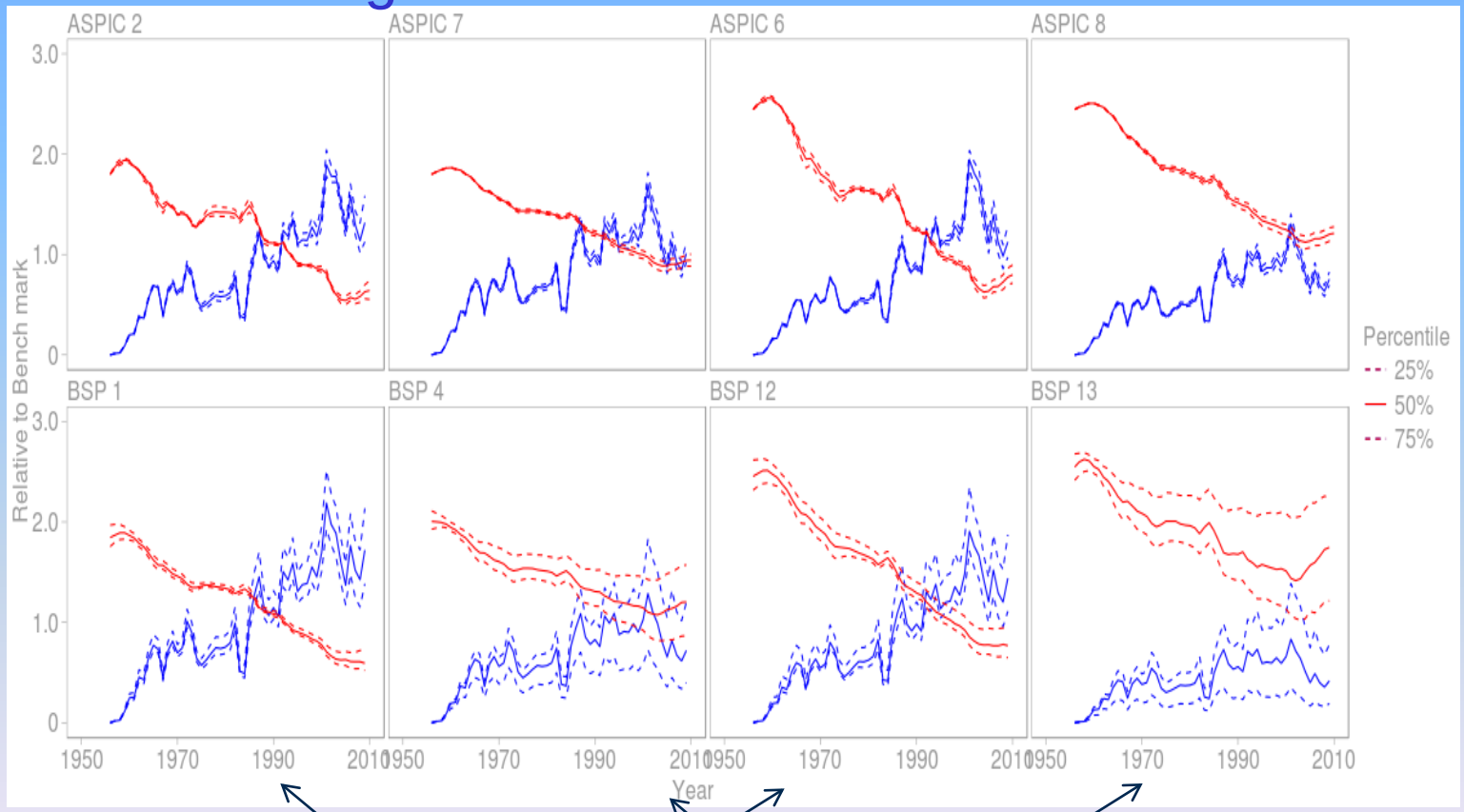
Task I catch. South Atlantic stock



Stock Status Remains Uncertain

Logistic

Fox



MSY

23,630 –

27,390

20,500 –

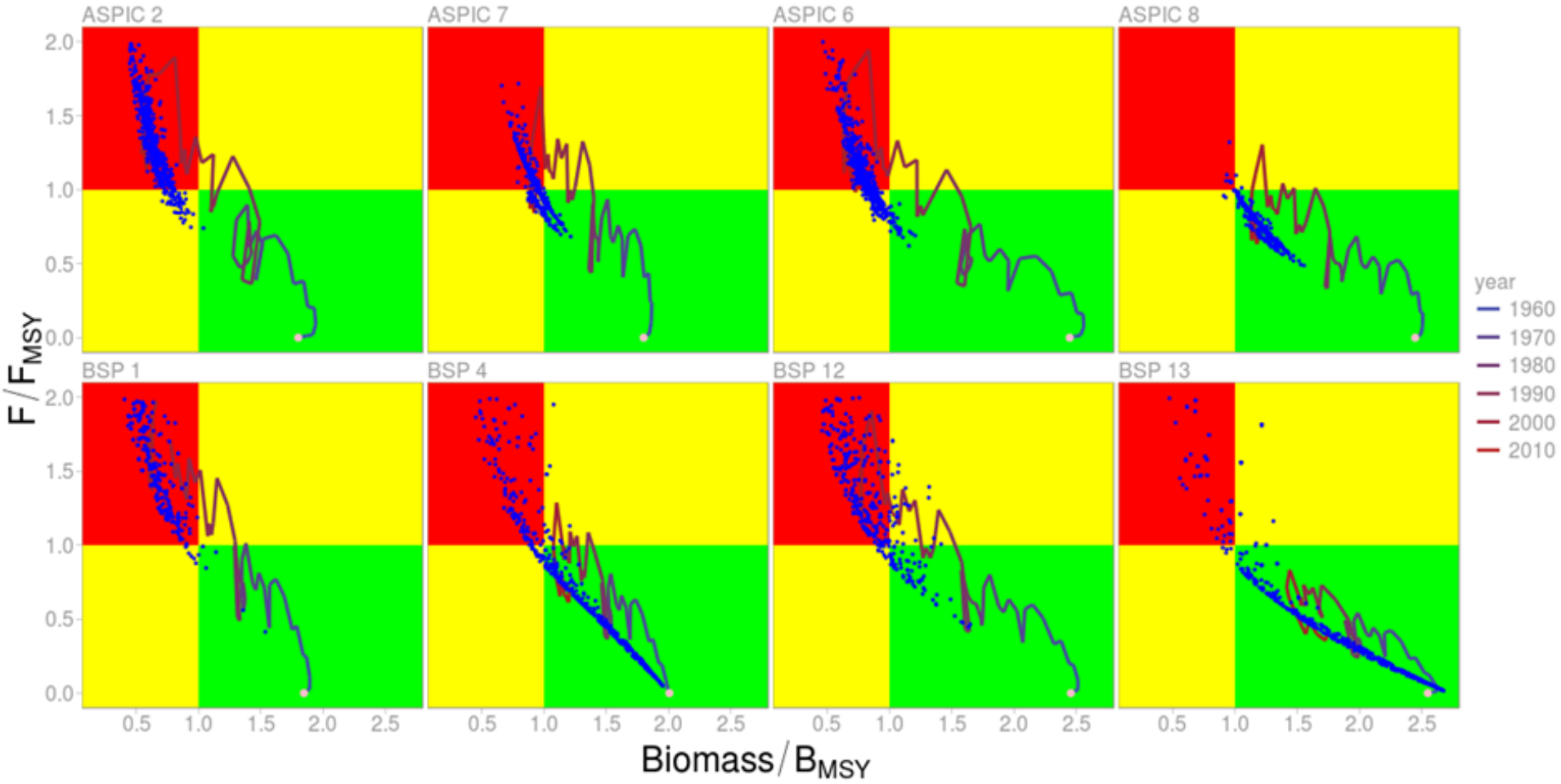
50,000

Equal weight

Catch weight

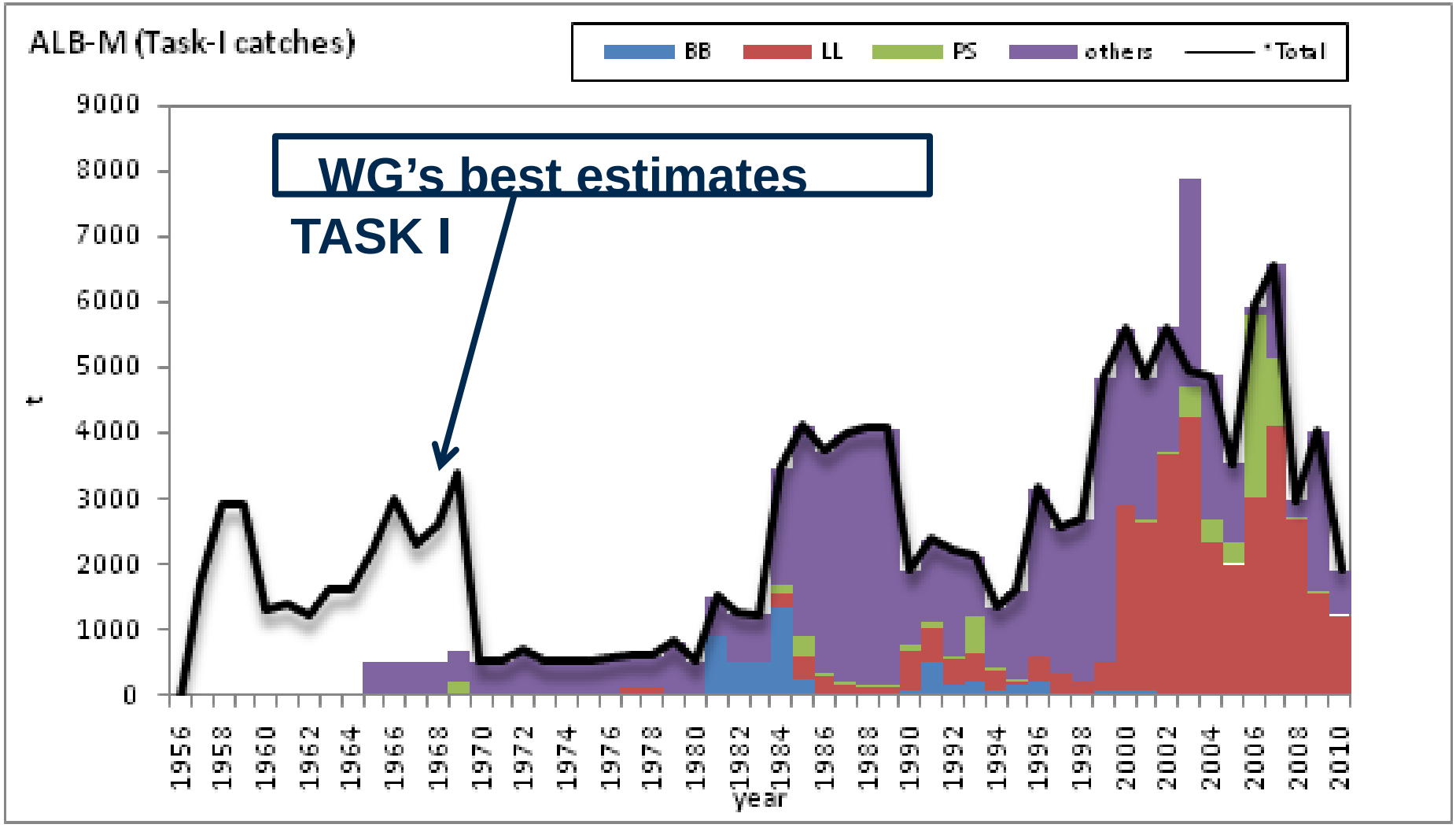
ALB- South Atlantic

Uncertainty of 2005 status determination



Albacore Fisheries

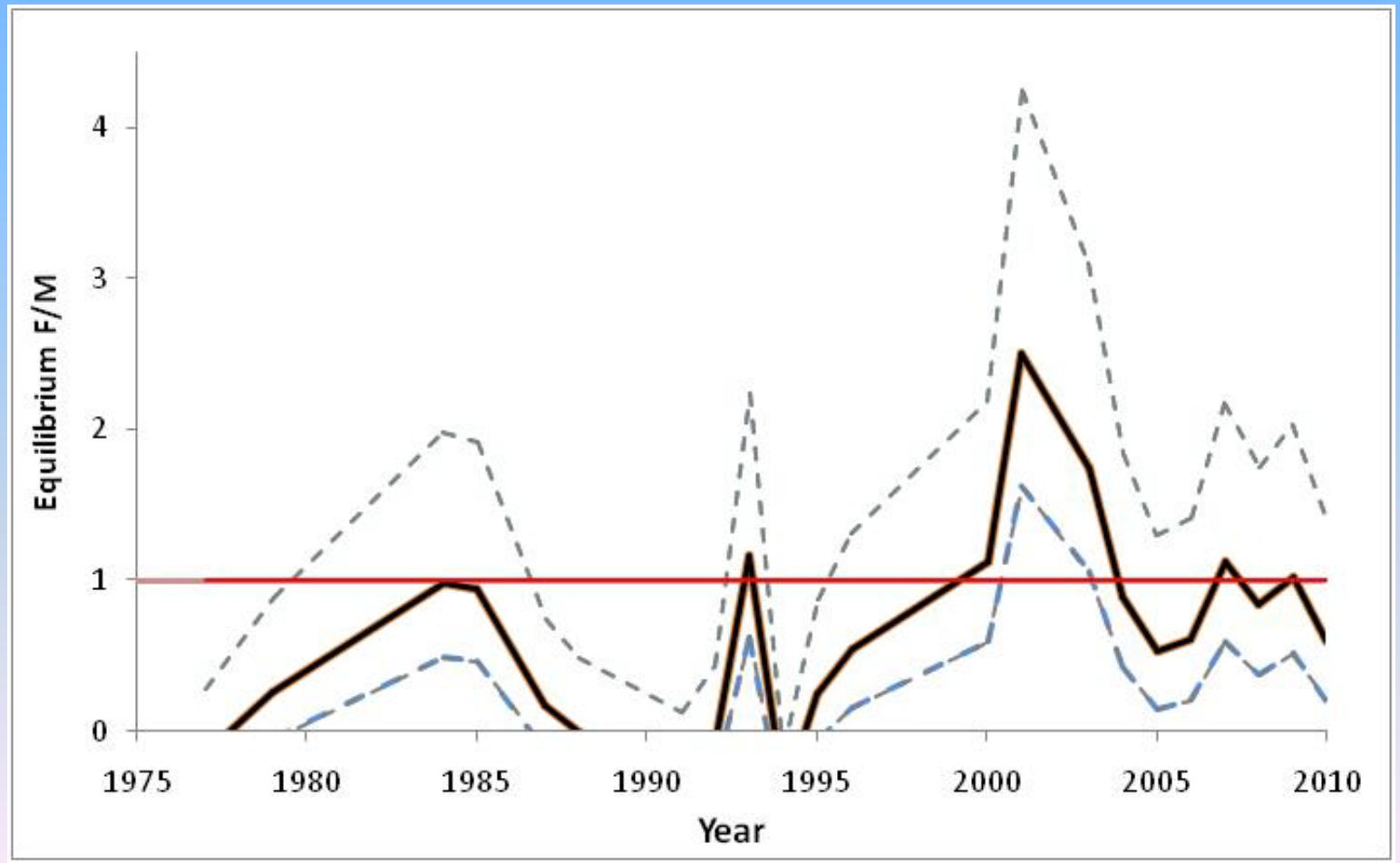
Task I catch. Mediterranean stock



Albacore Fisheries

Mediterranean stock

Time series of estimated F relative to M (agreed proxy for FMSY):



Mediterranean Albacore Assessment Summary

- *relatively stable pattern for Mediterranean albacore biomass over the recent past*

  (very little quantitative information is available to SCRS for use in conducting a robust quantitative characterization on biomass status relative to Convention Objectives)

- *recent fishing mortality levels appear to have been reduced from those of the early 2000's , which were likely in excess of FMSY, and might now be at, about, or lower than* F_{MSY} *level*

Mediterranean Albacore Assessment Summary

ATLANTIC AND MEDITERRANEAN ALBACORE SUMMARY

	North Atlantic	South Atlantic	Mediterranean
Current (2010) Yield	19,292 t	18,825 t	2,123 t
Maximum Sustainable Yield	29,000 t	27,964(23,296-98,371) t[1]	Unknown
Replacement Yield (2009)	Not estimated	Not estimated	Not estimated
SSB_{2007}/SSB_{MSY} [2]	0.62 (0.45-0.79)[2]		Not estimated
SSB_{2009}/SSB_{MSY} [1]		0.88 (0.53-1.86)[1]	
Relative Fishing Mortality			
F_{2007}/F_{MSY} [2]	1.045 (0.85-1.23) [2]		<=1 [3]
F_{2009}/F_{MSY} [1]		1.13 (0.25-1.86)[1]	
Management measures in effect	[Rec. 98-08]: Limit No. of vessels to 1993-1995 average TAC: 28,000 t [Rec. 09-05] for 2010 and 2011.	[Rec. 07-03]: Limit Catches to 29,900 t until 2011	None

[1] Reference points estimates based on 2011 assessment. Median range and 80% CI calculated for the whole range of the 8 base cases. […]

[2] Reference points estimates based on 2009 assessment. 95% CI around the reference points were based on estimated 2007 standard errors in the North stock.

[3] Estimated with length converted catch curve analysis, taking M as a proxy for F_{MSY}.

SCRS BAYS Recommendations

- Reinforces the recommendation for a research program for North Atlantic albacore focused on biology and ecology, fisheries data, and management advice, at a cost of 4.3 million Euros over 4 years.

- The SCRS recommended continuing the work towards integrating the various studies relating life history parameters and ecology for Mediterranean albacore.

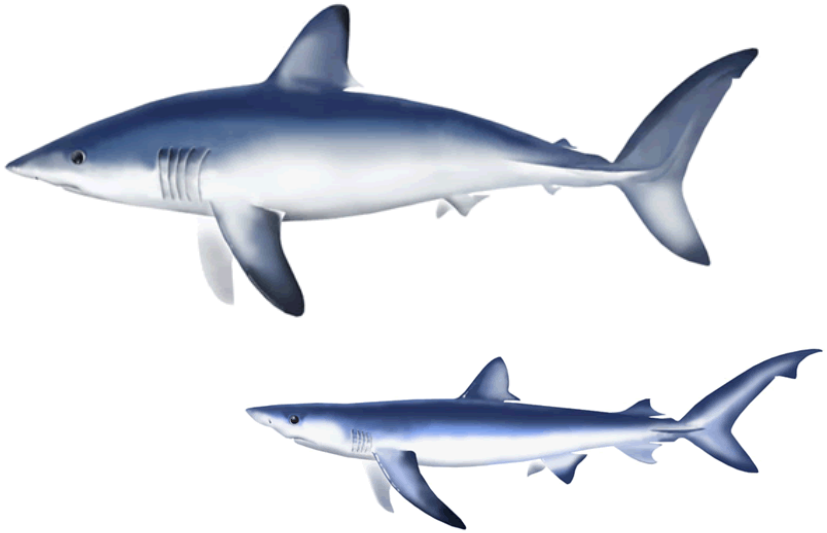
- Reiterates the recommendation for a broad-scale, stock wide tagging program for bigeye, yellowfin and skipjack. This would include both conventional and electronic tags, and would be focused on answering questions of stock structure, movement, fishing and natural mortality, growth, etc.

- The Committee encourages the continuation of the collaboration between Ghanaian and IRD (France) scientists.

- Several recommendations concerning improvement of research and the statistics of tropical tunas, can be found in the Detailed Report of the 2011 Tropical Tuna Species Group Inter-sessional Meeting on the Ghanaian Statistics Analysis (Phase II) and in the Detailed Report of the 2011 ICCAT Yellowfin Tuna Stock Assessment Session.

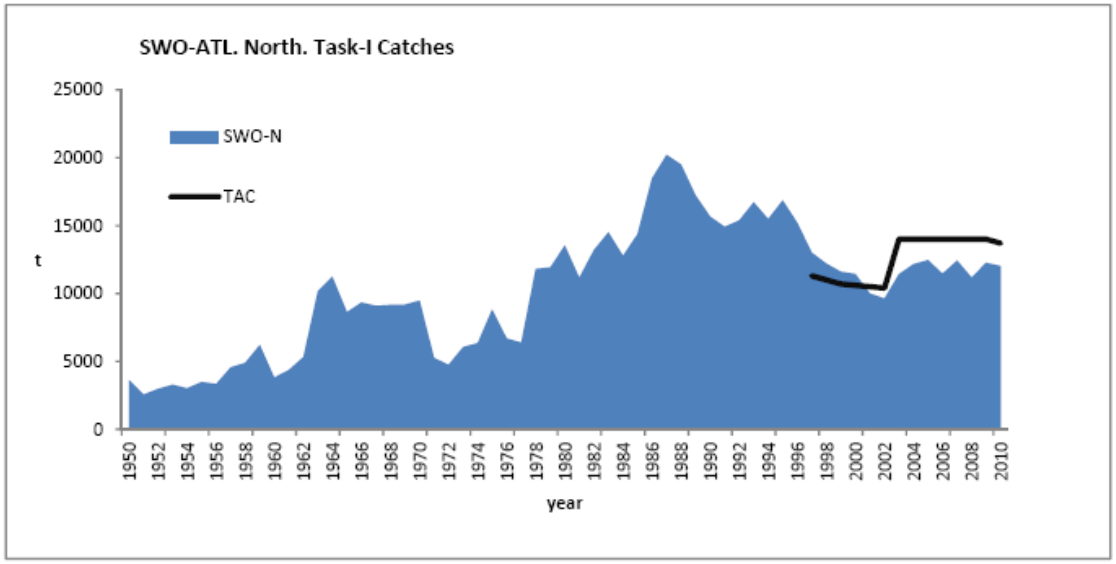
NOAA
FISHERIES
SERVICE

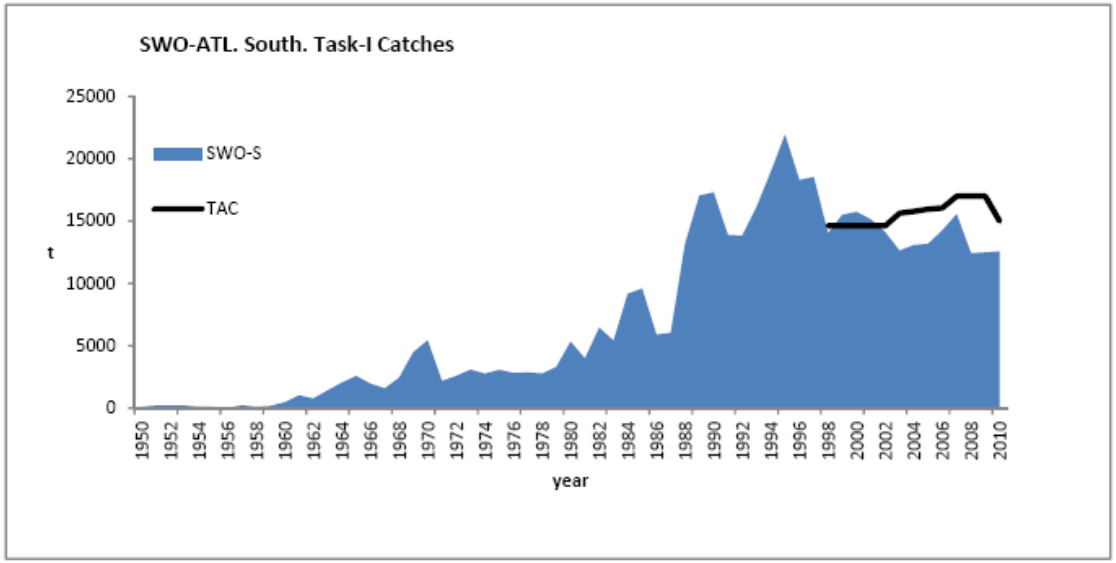
Swordfish/Shark Working Group



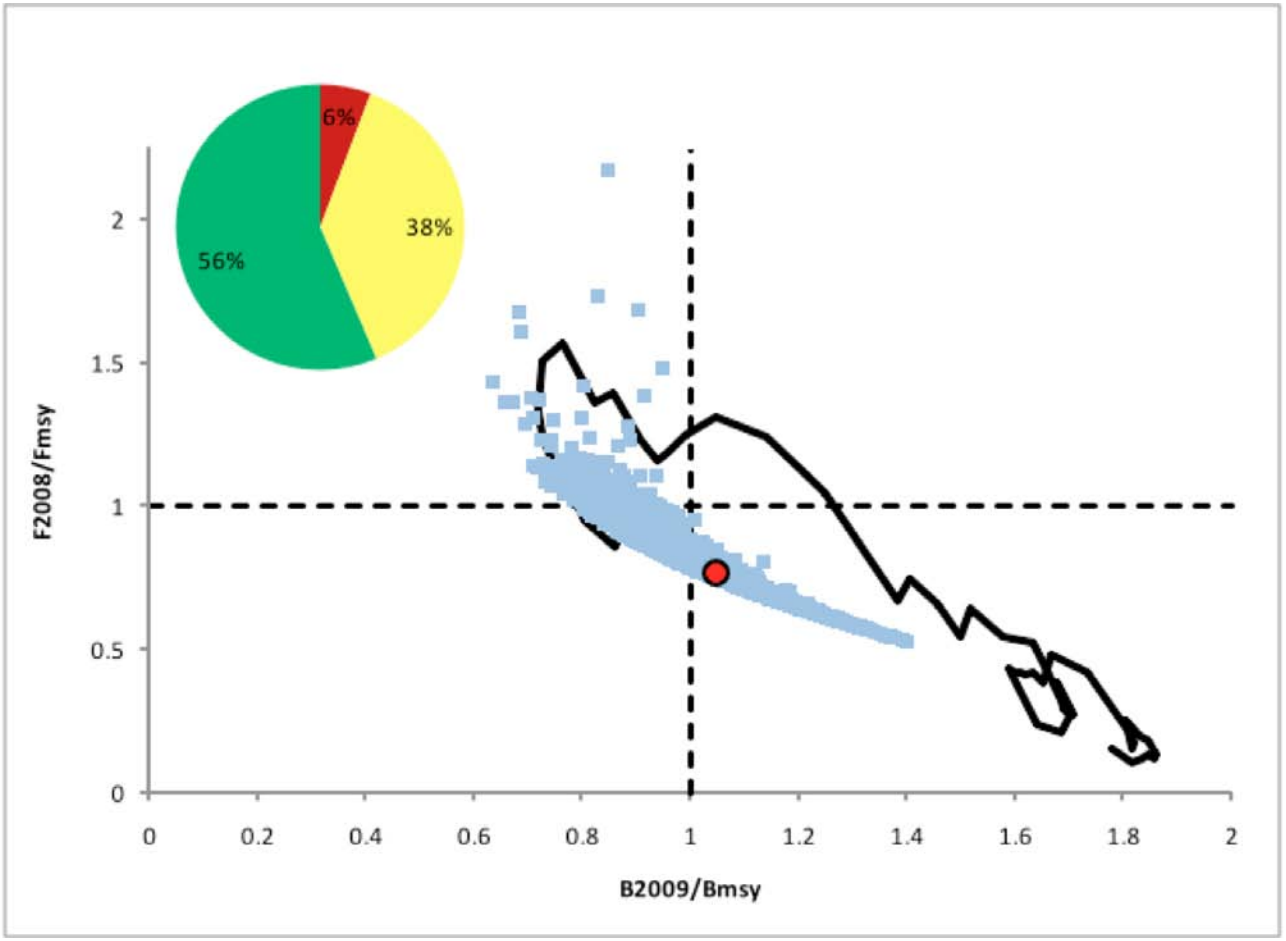
Landings in Relation to TAC, North and South.

In both the North and South Atlantic, recent catches have been less than the TAC.





Stock Status, North.

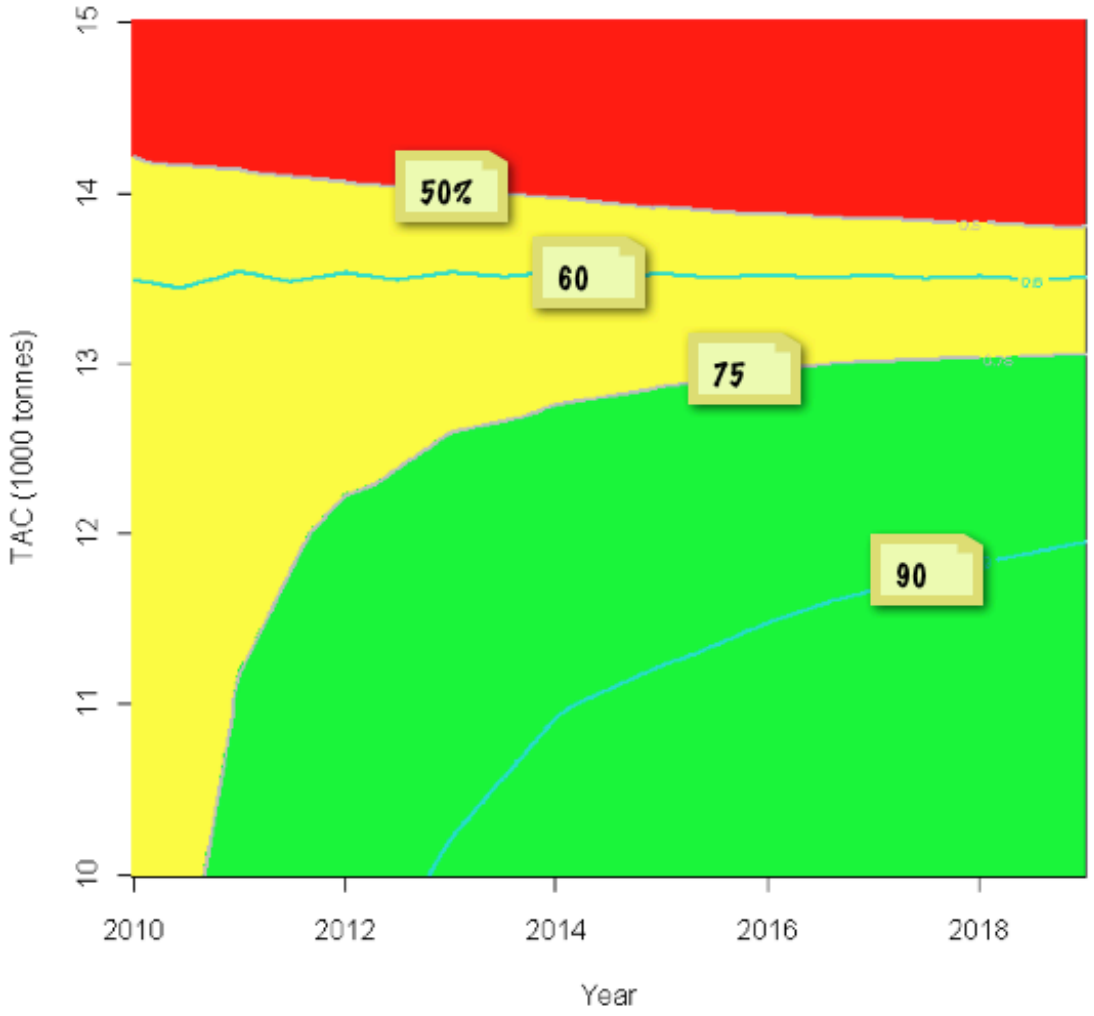


The results suggest that there is greater than 50% probability that the stock is at or above B_{MSY}, *and thus the Commission's rebuilding objective [99-2] has been achieved.*

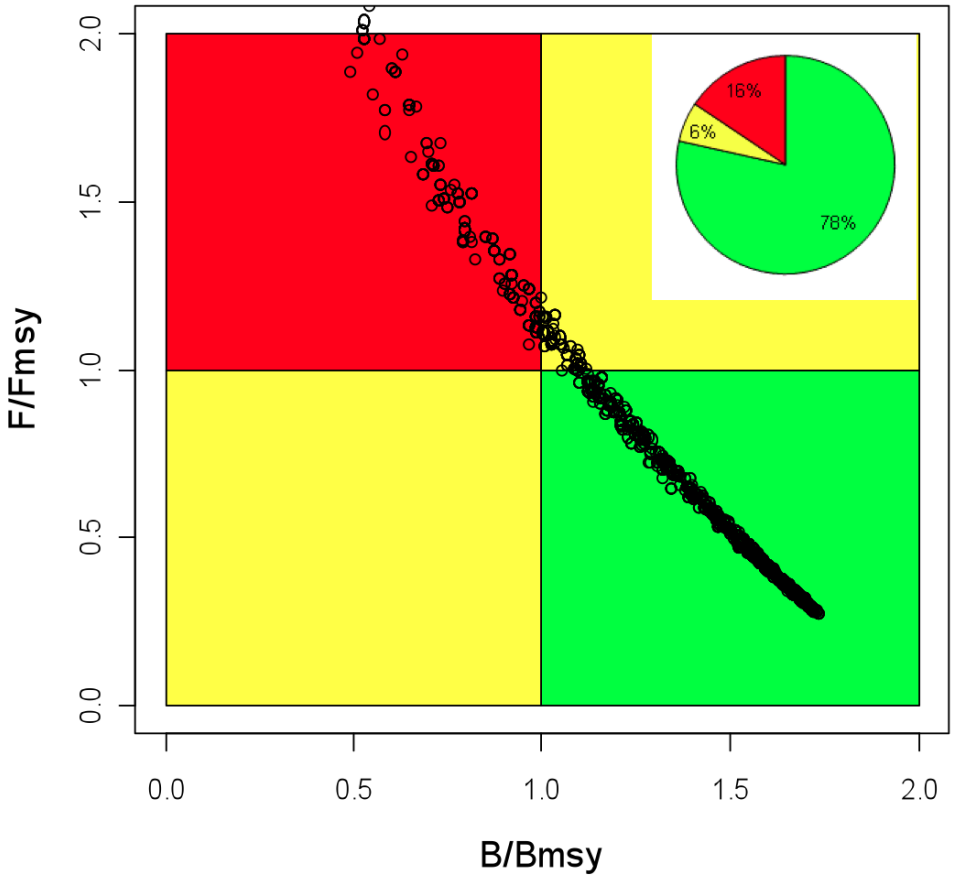
Probability of staying in the Rebuilt Zone given varying future catches, North Atlantic

- This plot shows probability contours of B>BMSY and F<FMSY for the constant catch scenarios indicated over time. Red areas represent probabilities less than 50%, yellow from 50-75%, and green above 75%. The 90th, 75th, 60th, and 50th probability contours are also depicted.

- A TAC of 13,000 t would provide approximately a 75% probability of maintaining the stock at a level consistent with the Convention Objective over the next decade.



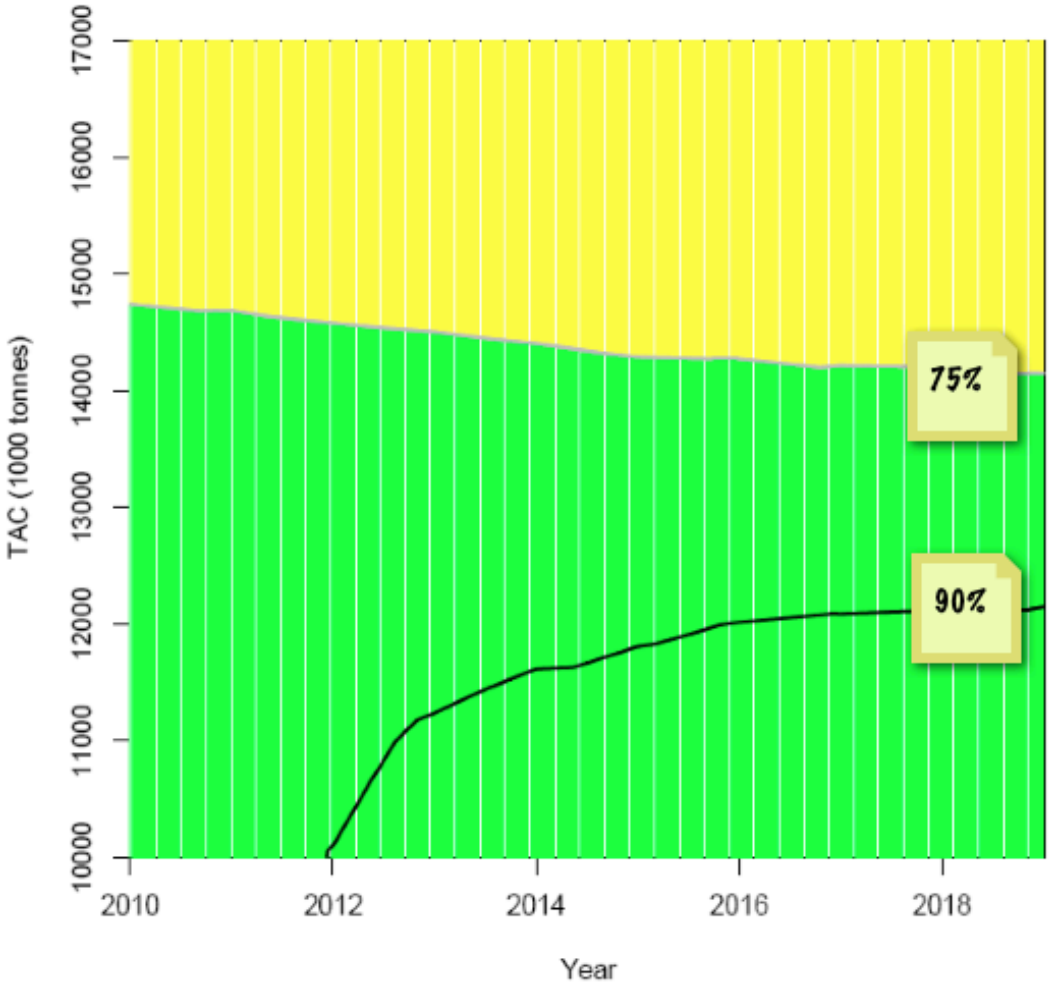
Stock Status, South.



Conditioned only on the catches**,** the model estimated a probability of 0.78 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.*

Probability of staying in the Rebuilt Zone given varying future catches, South Atlantic

- This analysis (conditioned on catch only) indicated that catches in the order of 17,000 will result in a probability of 0.67 of being above B_{MSY} in ten years.
- However, considering the unquantified uncertainties and the 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.



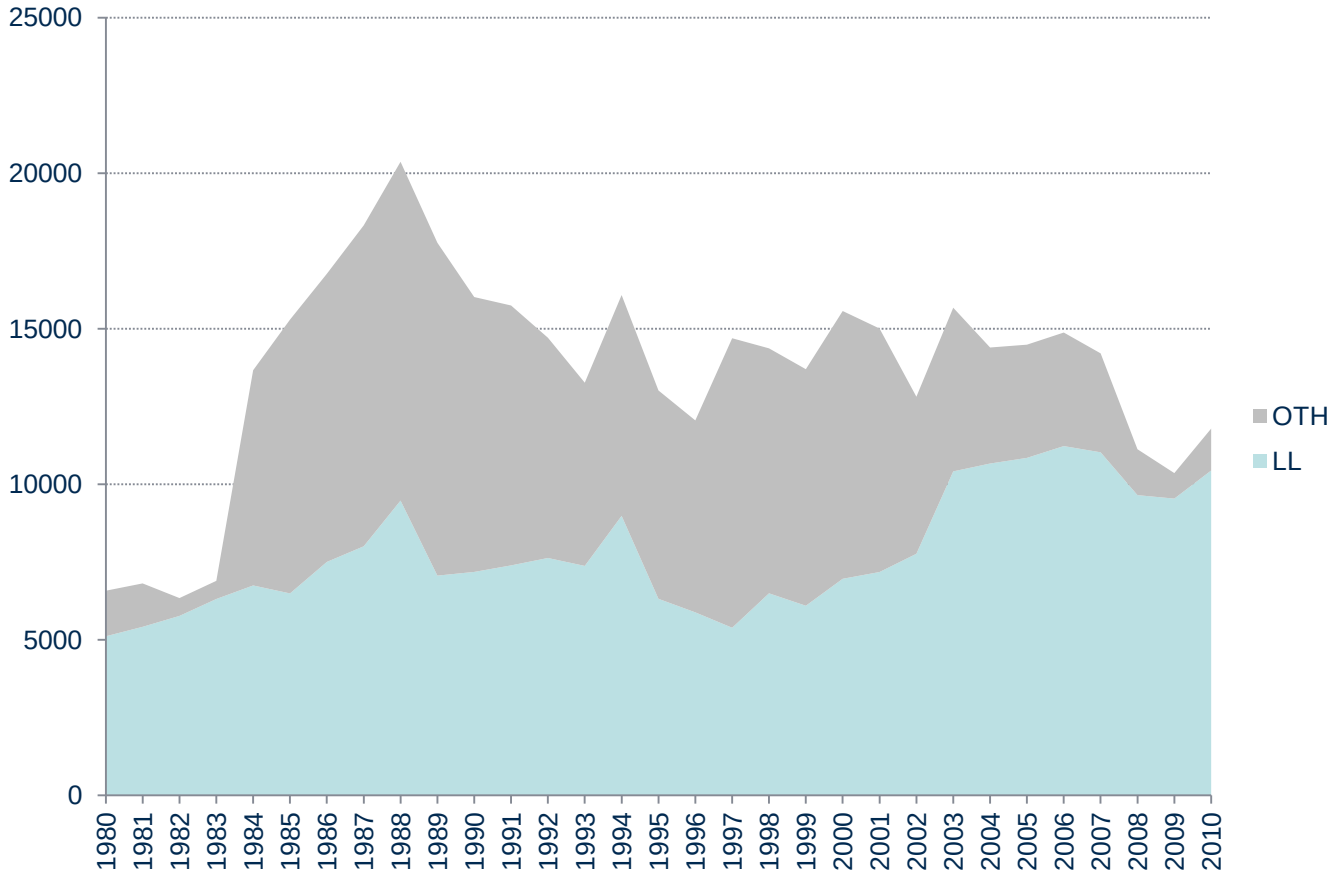
ATLANTIC SWORDFISH SUMMARY

	North Atlantic	South Atlantic
Maximum Sustainable Yield[1]	13,730 t (13,020-14,182)[3]	~15,000 t
Current (2010) TAC	13,700 t	15,000 t
Current (2010) Yield[2]	12,154 t	12,566 t
Yield in last year used in assessment (2008)	11,188 t[5]	12,363 t[5]
B_{MSY}	61,860 (53,280-91,627)	47,700
F_{MSY}	0.22 (0.14-0.27)	0.31
Relative Biomass (B_{2009}/B_{MSY})	1.05 (0.94-1.24)	1.04 (0.82-1.22)
Relative Fishing Mortality (F_{2008}/F_{MSY}[1])	0.76 (0.67-0.96)	0.75 (0.60-1.01)
Stock Status	Overfished: NO Overfishing: NO	Overfished: NO Overfishing: NO
Management Measures in Effect:	Country-specific TACs [Rec. 10-02]; 125/119cm LJFL minimum size	Country-specific TACs [09-03] 125/119cm LJFL minimum size

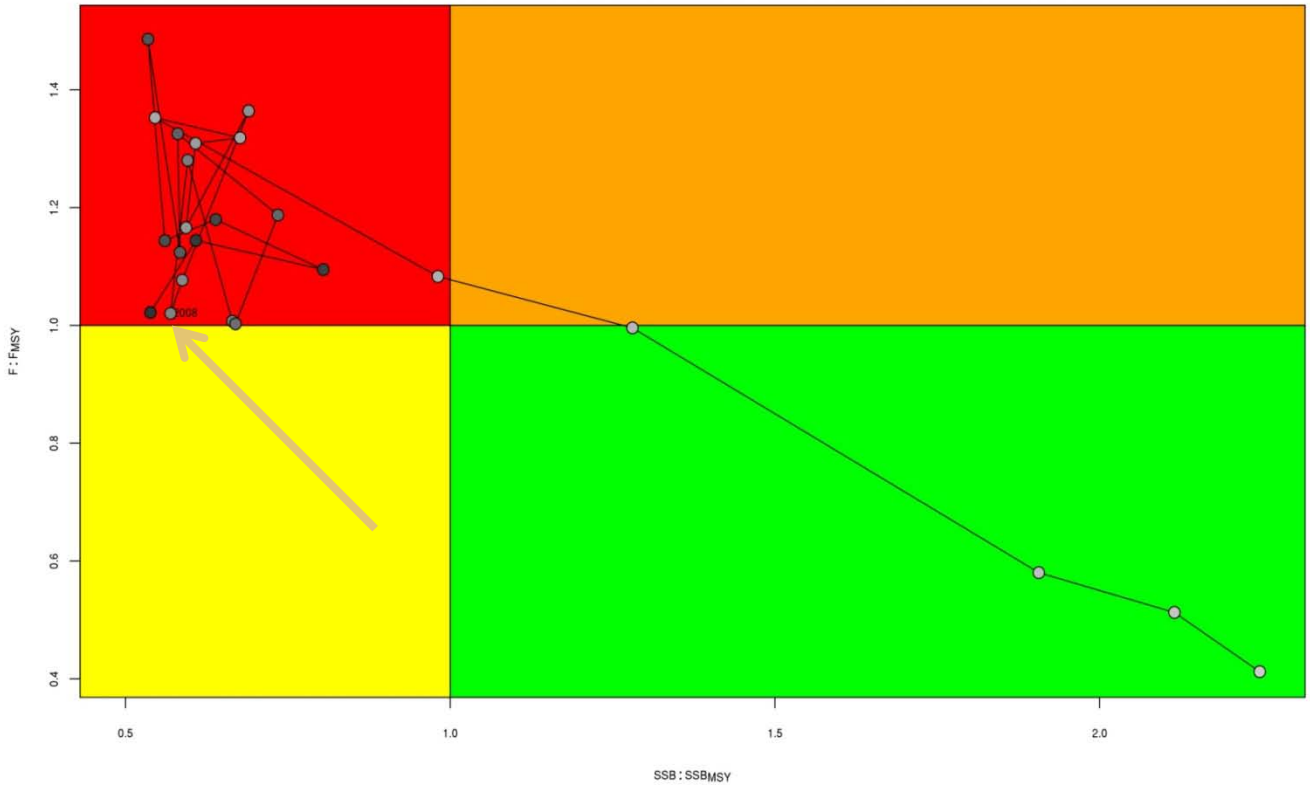
[1] Base Case production model (Logistic) results based on catch data 1950-2008.
[2] Provisional and subject to revision.
[3] 80% bias corrected confidence intervals are shown.
[4] Provisional and preliminary, based on production model results that included catch data from 1970-2008.
[5] As of 29 September 2010.

SWO MED Fisheries

- Main gears: Longlines & Gillnets
- Catches around 12000-16000 t in the last 15 years
- 13,429 t in 2010



SWO MED Stock status (2010 assessment)



Based on XSA results

SWO MED Summary table

Maximum Sustainable Yield	14,600-16,700
Current (2010) Yield	13,429 t
Current (2008) Replacement Yield	~12,100 t
Relative Biomass (B_{2008}/B_{MSY})	0.54-0.96
Relative Fishing Mortality	
F_{2008}/F_{MSY}	1.03-1.12
F_{2008}/F_{MAX}	0.91
$F_{2008}/F_{0.1}$	1.52
$F_{2008}/F_{30\%SPR}$	1.32
Management measures in effect	Driftnet ban [Rec. 03-04] Two month fishery closure

NOAA FISHERIES SERVICE

SCRS Shark Recommendations

- The SCRS is pleased with the conservation and management measures adopted by the Commission in the last two years regarding the species classified as the most vulnerable in the last ecological risk assessment and on those for which no data were presented (bigeye thresher, oceanic whitetip and hammerhead). At the same time, the SCRS expressed its concern that no conservation and management measures have been adopted up to now on silky shark (Carcharhinus falciformis), classified in the ERA among the most vulnerable species. Consequently, the SCRS recommended that adequate conservation and management measures, similar to those adopted for the aforementioned species also be adopted for silky shark.

- 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.

- 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 by-catch species section.

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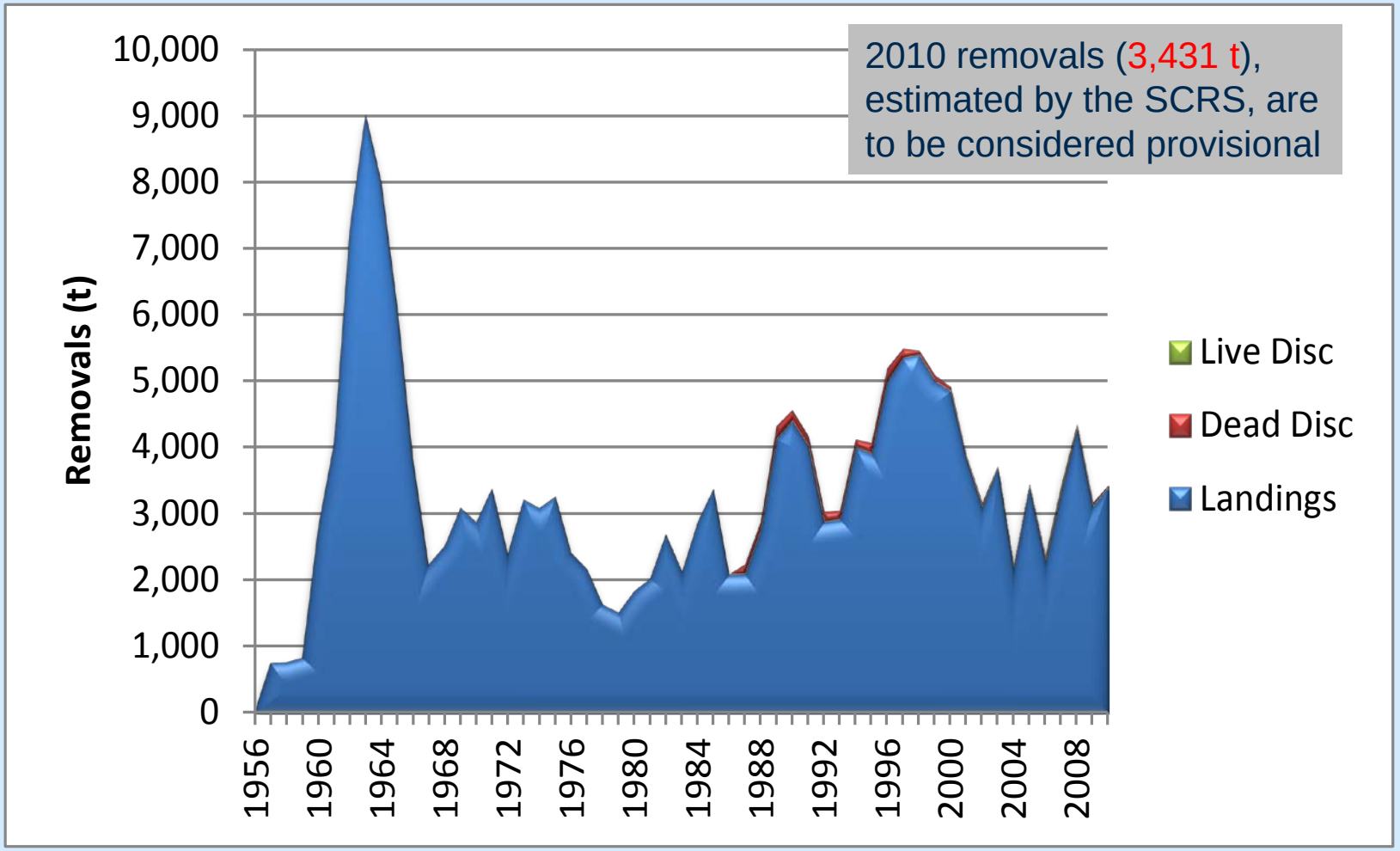
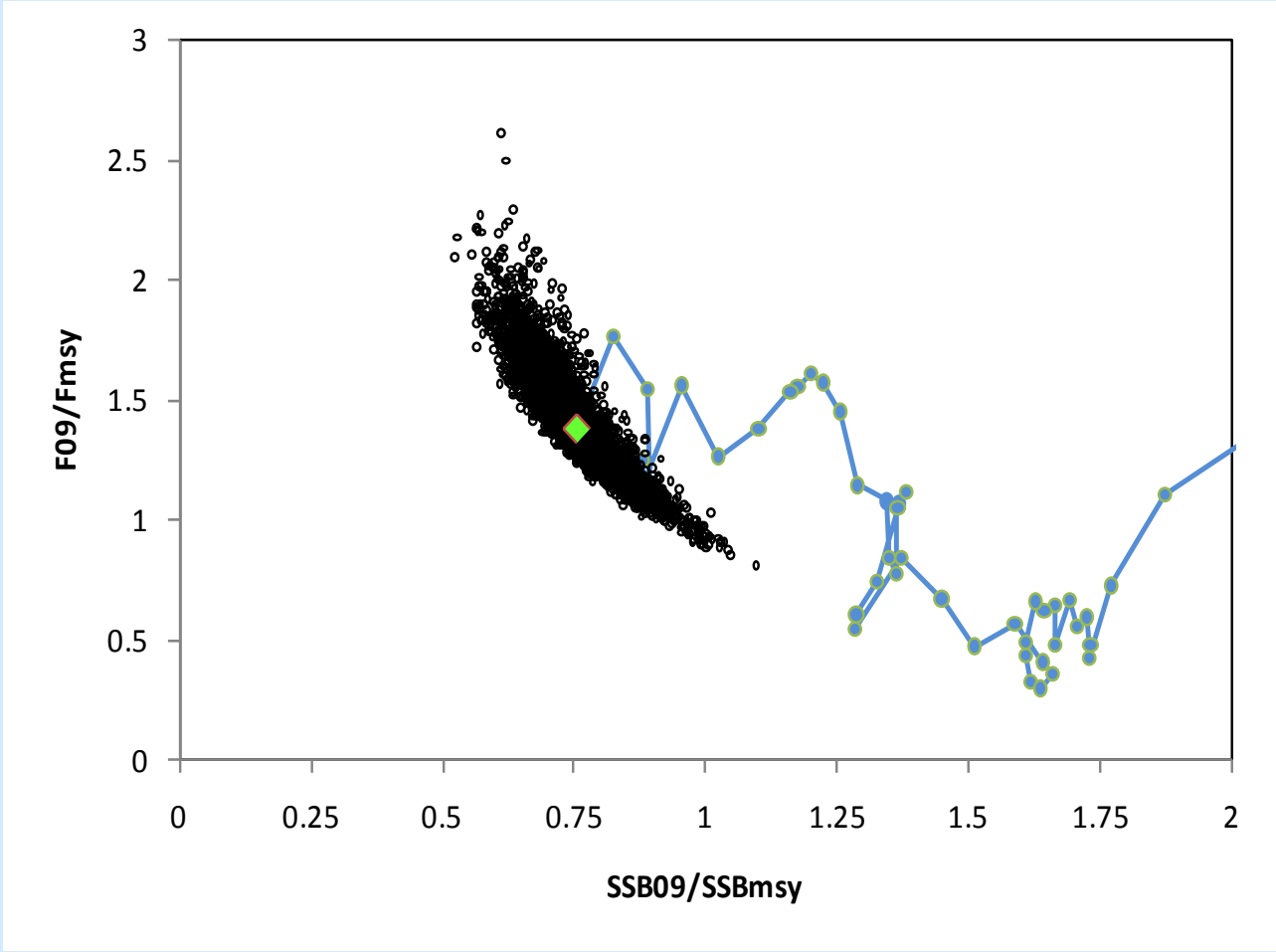
Billfish Working Group

Blue Marlin Landings



Current BUM Stock Status

Overfished and undergoing overfishing

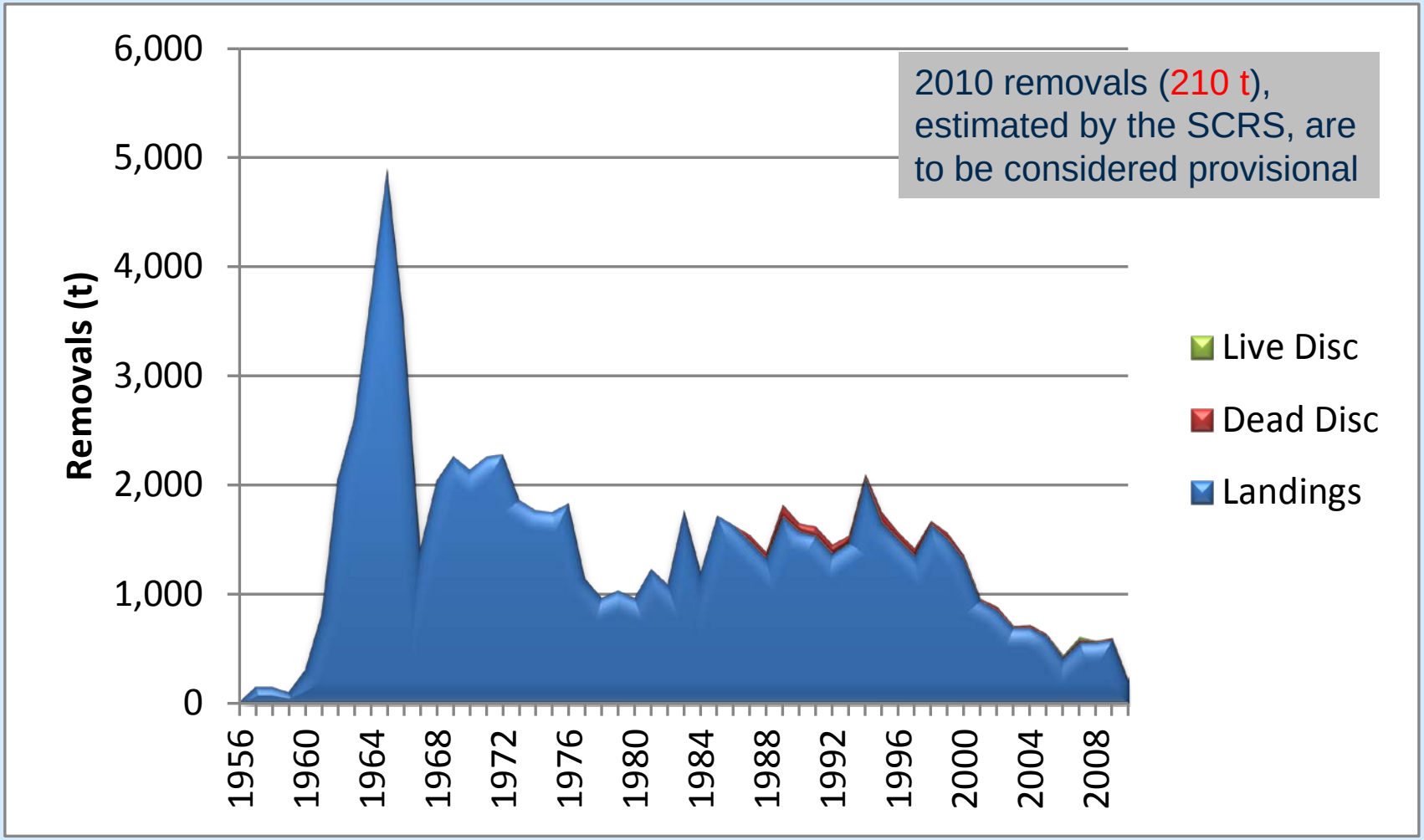


Blue Marlin Summary Table

ATLANTIC BLUE MARLIN SUMMARY	
	BUM
Maximum Sustainable Yield	2,837 t (2,343 – 3,331 t)[1]
Current (2010) Yield	3,150 t[2]
Relative Biomass (SSB_{2009}/SSB_{MSY})	0.67 (0.53 – 0.81)[1]
Relative Fishing Mortality (F_{2009}/F_{MSY})	1.63 (1.11 – 2.16)[1]
Conservation and Management Measure in Effect	Recommendation [Rec. 06-09]. The annual amount of blue marlin that can be harvested by pelagic longline and purse seine vessels and retained for landing must be no more than 33% for white marlin and 50% for blue marlin of the 1996 or 1999 landing levels, whichever is greater.

White Marlin Landings

It has been confirmed that white marlin catches reported to ICCAT include significant numbers of round scale spearfish which can be between 22-27% in some areas of the Atlantic, and no contamination in other areas.



White Marlin Summary Table

ATLANTIC WHITE MARLIN SUMMARY	
	WHM
[1]MSY	[5] 600-1,320 t
Current (2010) Yield	299 t [2]
B_{2004} / [1]B_{MSY}	< 1.0
Recent Abundance Trend (2001-2004)	Slightly upward
$F_{2004} > F_{replacement}$	No
F_{2004} > [1]F_{MSY}	Possibly > 1.0
[3]$Catch_{recent}/Catch_{1996}$ Longline and Purse seine	0.47
[4]$Catch_{2004}$	610 t
Rebuilding to B_{MSY}	Potential to rebuild under current management plan, but needs verification.
Conservation and Management Measure in Effect	Recommendation [Rec. 06-09]. The annual amount of blue marlin that can be harvested by pelagic longline and purse seine vessels and retained for landing must be no more than 33% for white marlin and 50% for blue marlin of the 1996 or 1999 landing levels, whichever is greater

White Marlin Biology: New Information

1. Information on size composition and sex ratio of WHM at 2 depth strata from the Uruguayan pelagic longline observer program on board Uruguayan and Japanese longline vessels. SCRS/2011/026

2. A study on genetic differentiation between WHM and RSP indicated that there is considerable year to year variation in the proportion of the 2 species over that past decade. SCRS/2011/051

3. Information on size, sex-ratio, and spatial distribution of WHM from the Spanish longline fleet targeting SWO during 1993-2010. SCRS/2011/035

WHM Conclusions

The white marlin historical reported catches may comprise a mixture of species, like *Tetrapturus georgii* (RSP) and *T. pfluegeri* (SPF) in addition to white marlin.

Acknowledging this, the white marlin stock assessment will be conducted in 2012 considering data reported as white marlin in the Task I and II data (including U.S. catches identified as RSP in recent years

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.

BUM/WHM Management Recommendations

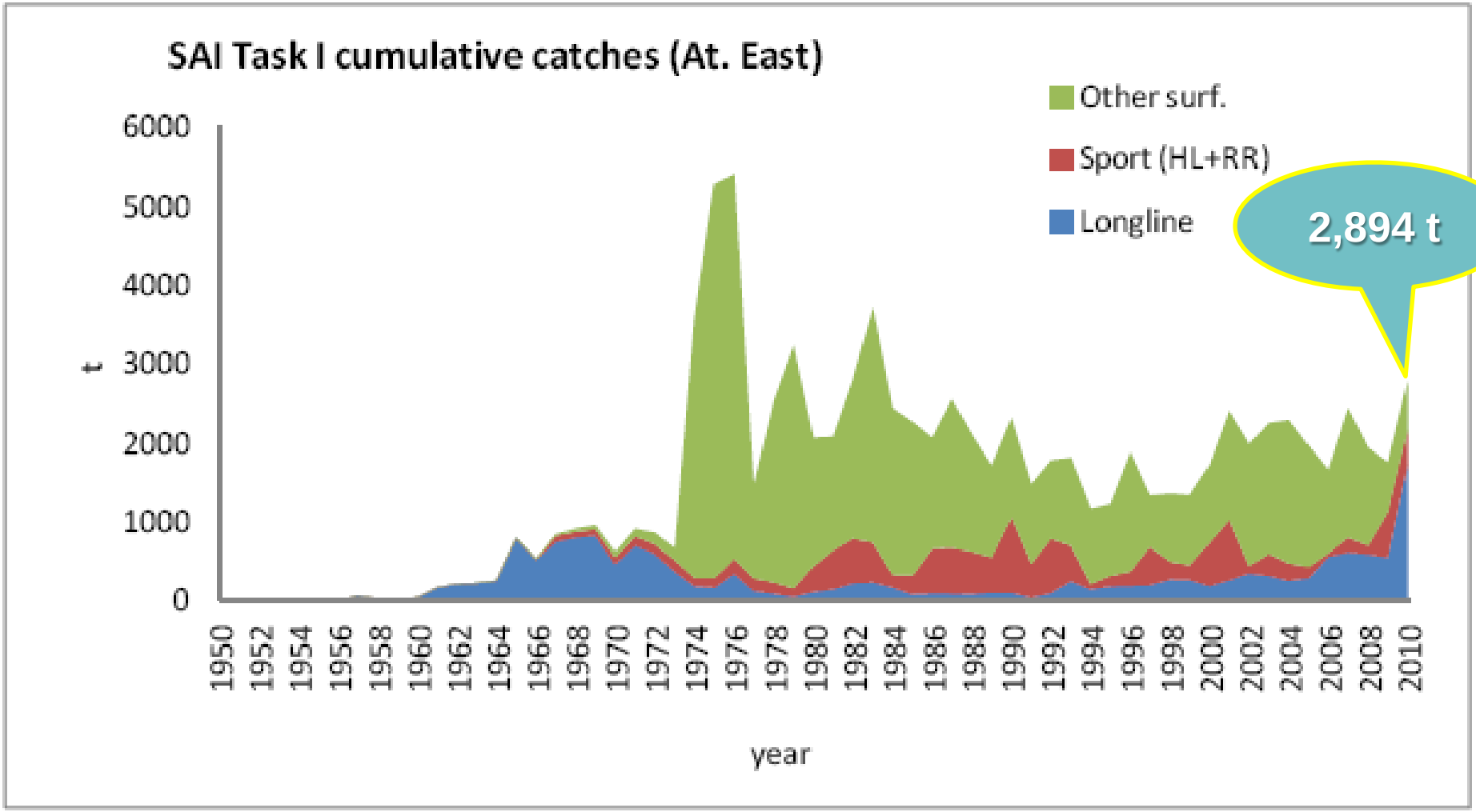
The current blue marlin stock assessment indicates, given the uncertainties, that the stock is below B_{MSY} and that fishing mortality is above F_{MSY} (2009). Unless the recent catch levels (3,240 t in 2009) are substantially reduced, the stock will likely continue to decline. The Commission should adopt a rebuilding plan for the stock of Atlantic blue marlin.

The Commission should implement management measures to immediately reduce fishing mortality on blue marlin stock by adopting a TAC that allow the stock to increase (2,000 t or less, including dead discards;

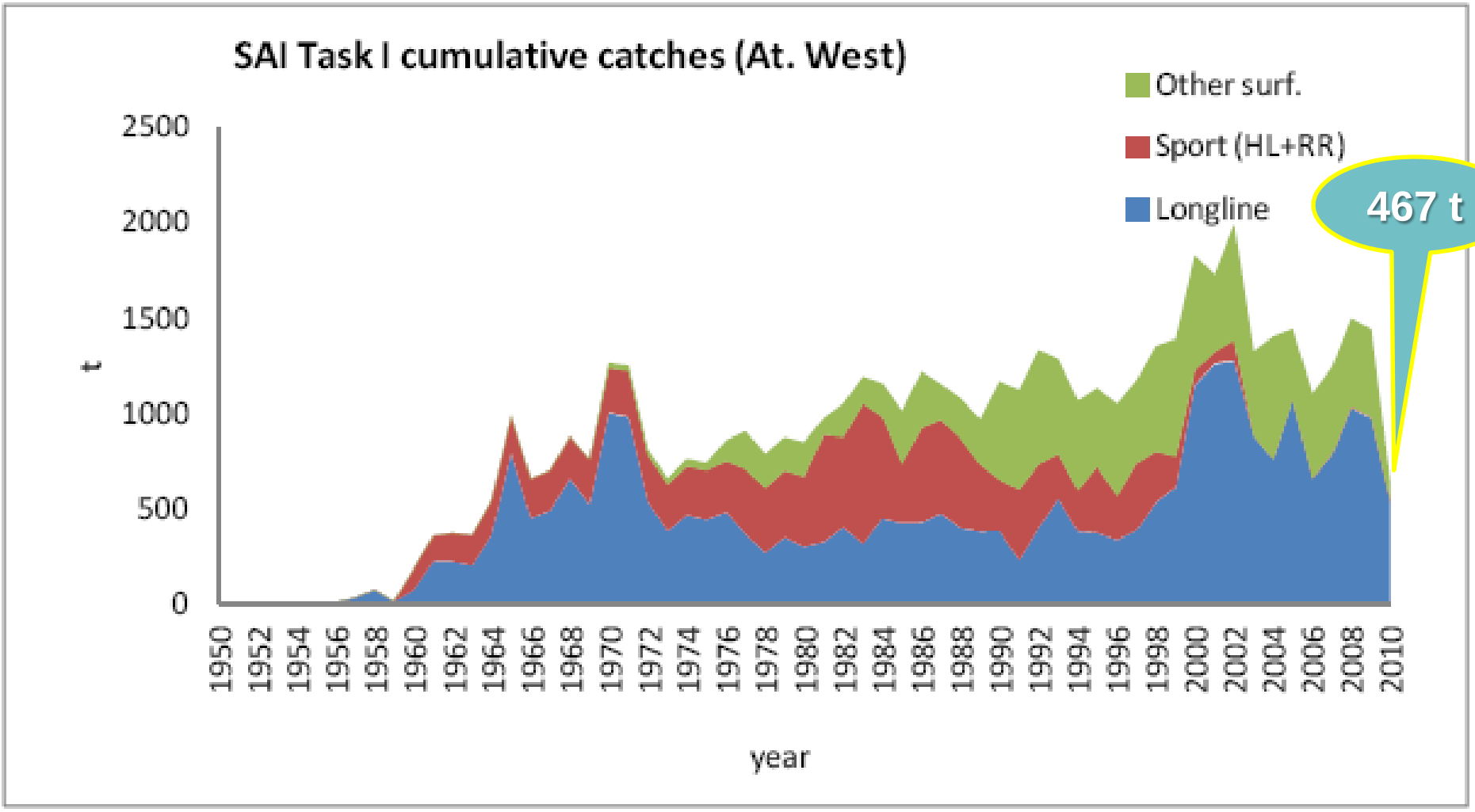
1. To facilitate the implementation of the TAC, the commission may consider the adoption of measures such as, but not limited to:
   a) **Total prohibition of landings of blue marlin from pelagic longline and purse seine fisheries** to improve the effectiveness of current management measures.
   b) **Encouraging 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) **Implementation of time-area closures**.
   d) **Reduce fishing mortality of blue marlin from non-industrial fisheries.**
2. Noting the misidentification problems between white marlin and spearfishes, the Group recommended that management recommendations combine these species as a mixed stock until more accurate species identification and differentiation of species catches are available.
3. The Commission should encourage the reporting of catches of white marlin and roundscale spearfish separated.

SAI. Fishery indicators

SAI East stock



SAI west stock

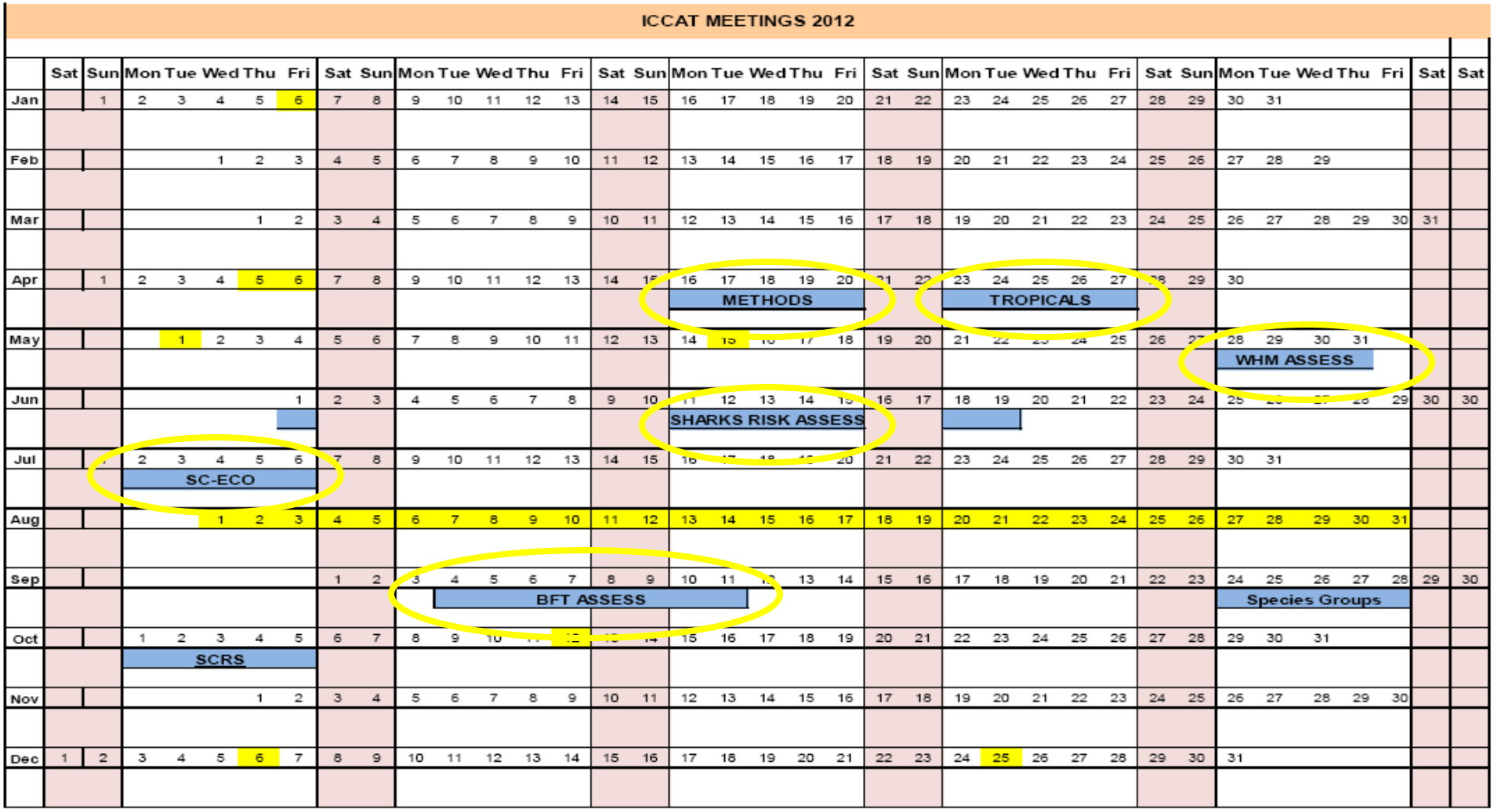


SAI. Summary table

ATLANTIC SAILFISH SUMMARY

	West Atlantic	East Atlantic
Maximum Sustainable Yield (MSY)	600-1,100[1] t	1,250-1,950[1] t
2010 Catches (Provisional)	467 t	2,894 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[2]	None[2]

[1] Results from Bayesian production model with informative priors. These results represent only the uncertainty in the production model fit. This range underestimates the total uncertainty in the estimates of MSY.
[2] Some countries have domestic regulations.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METHODS
TROPICALS
WHM ASSESS
SHARKS RISK ASSESS
SC-ECO
BFT ASSESS
Species Groups
SCRS