Science, Service, Stewardship

Presentation of SCRS Meeting Results and Advice

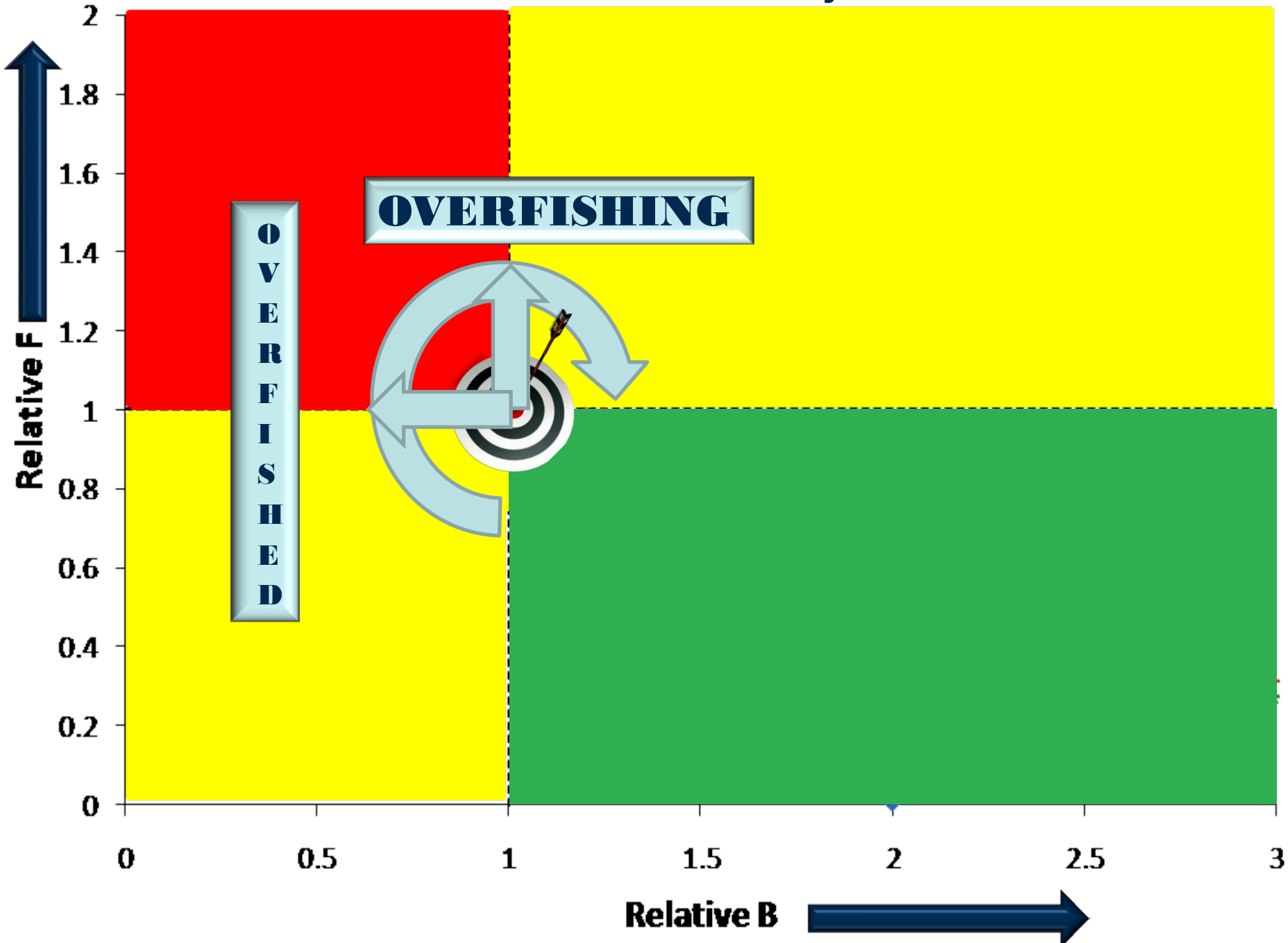
IAC, October 2010

NOAA FISHERIES SERVICE

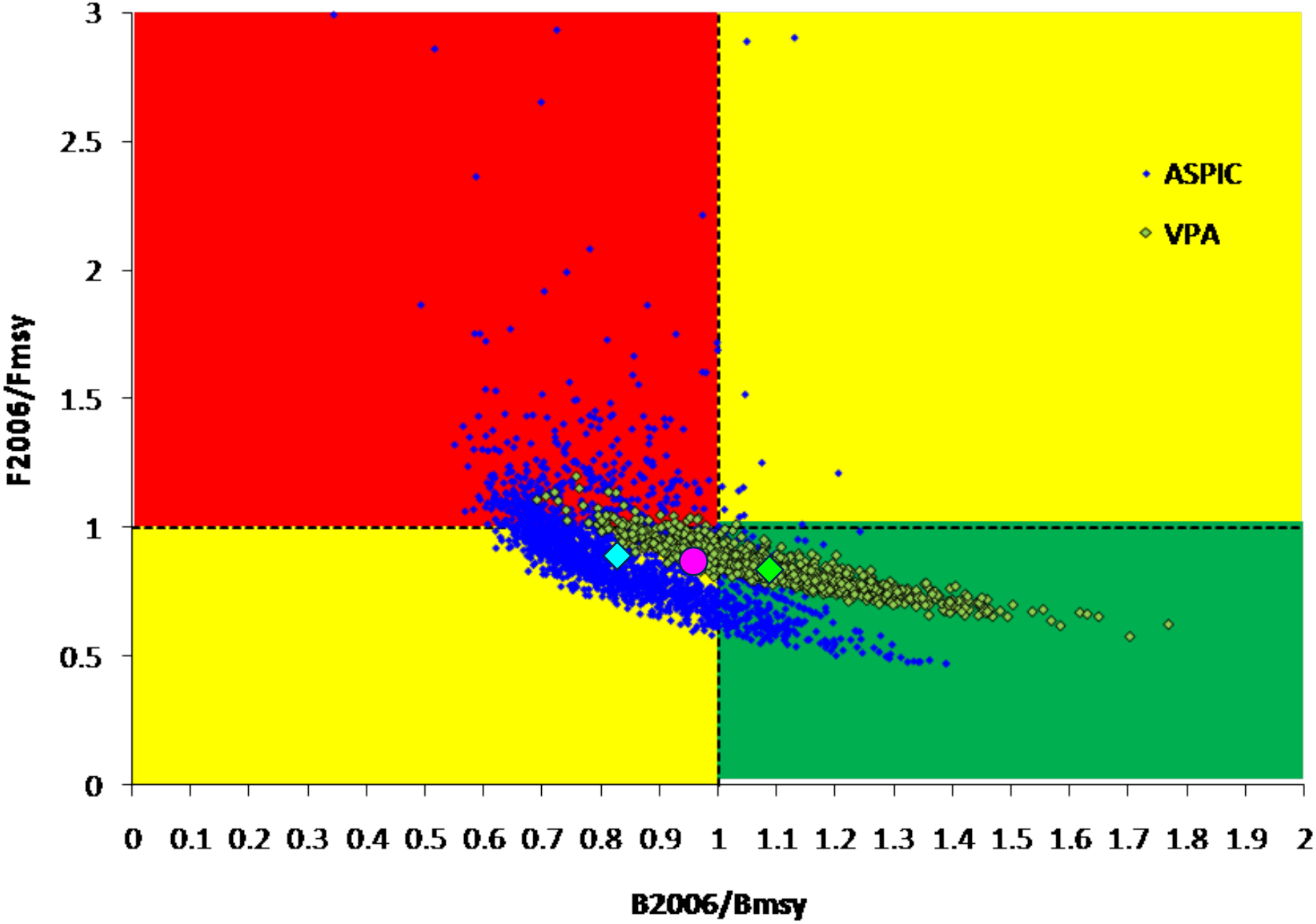
NOAA
FISHERIES
SERVICE

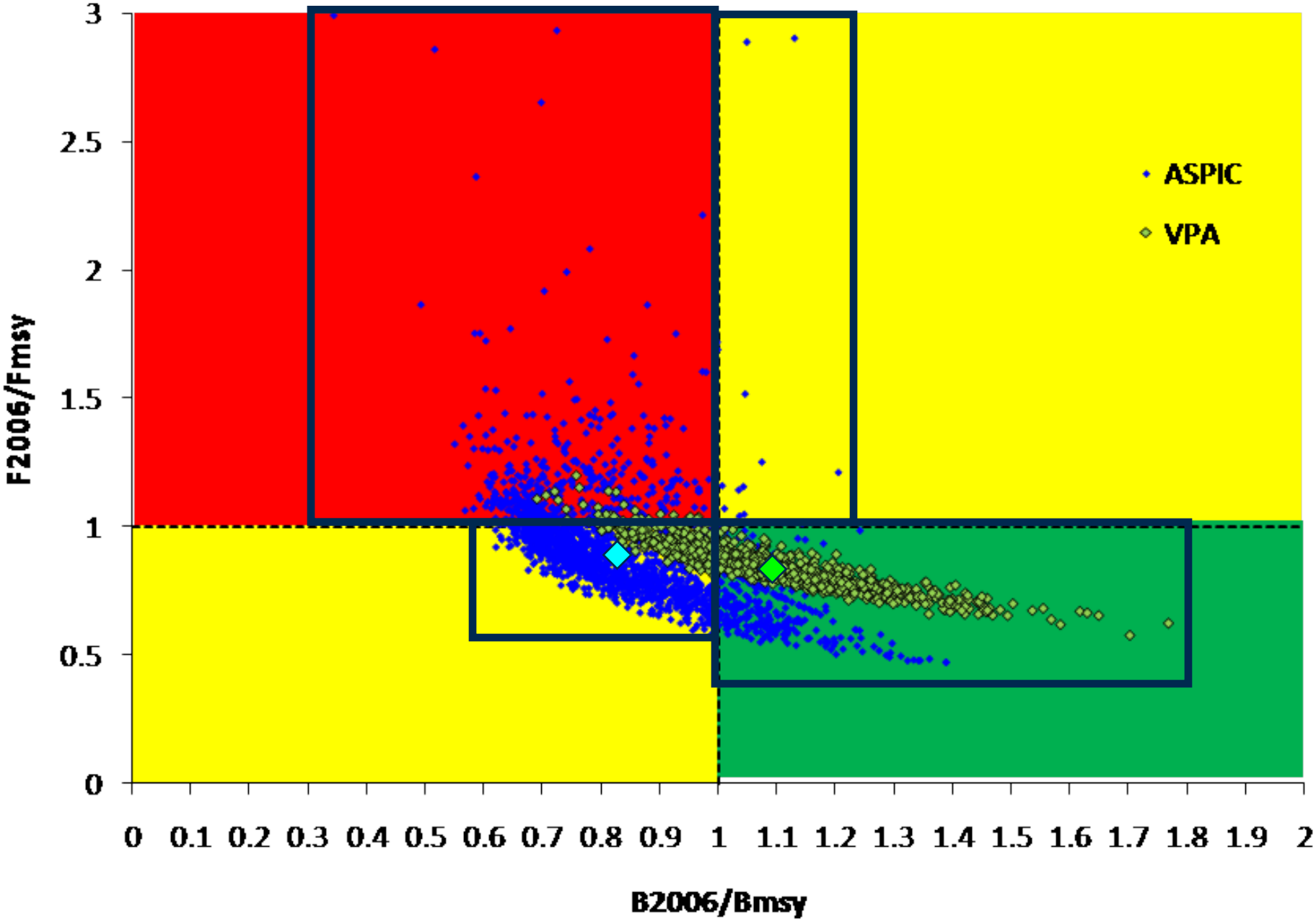
Bigeye, Albacore, Yellowfin and Skipjack (BAYS) Tunas Working Group

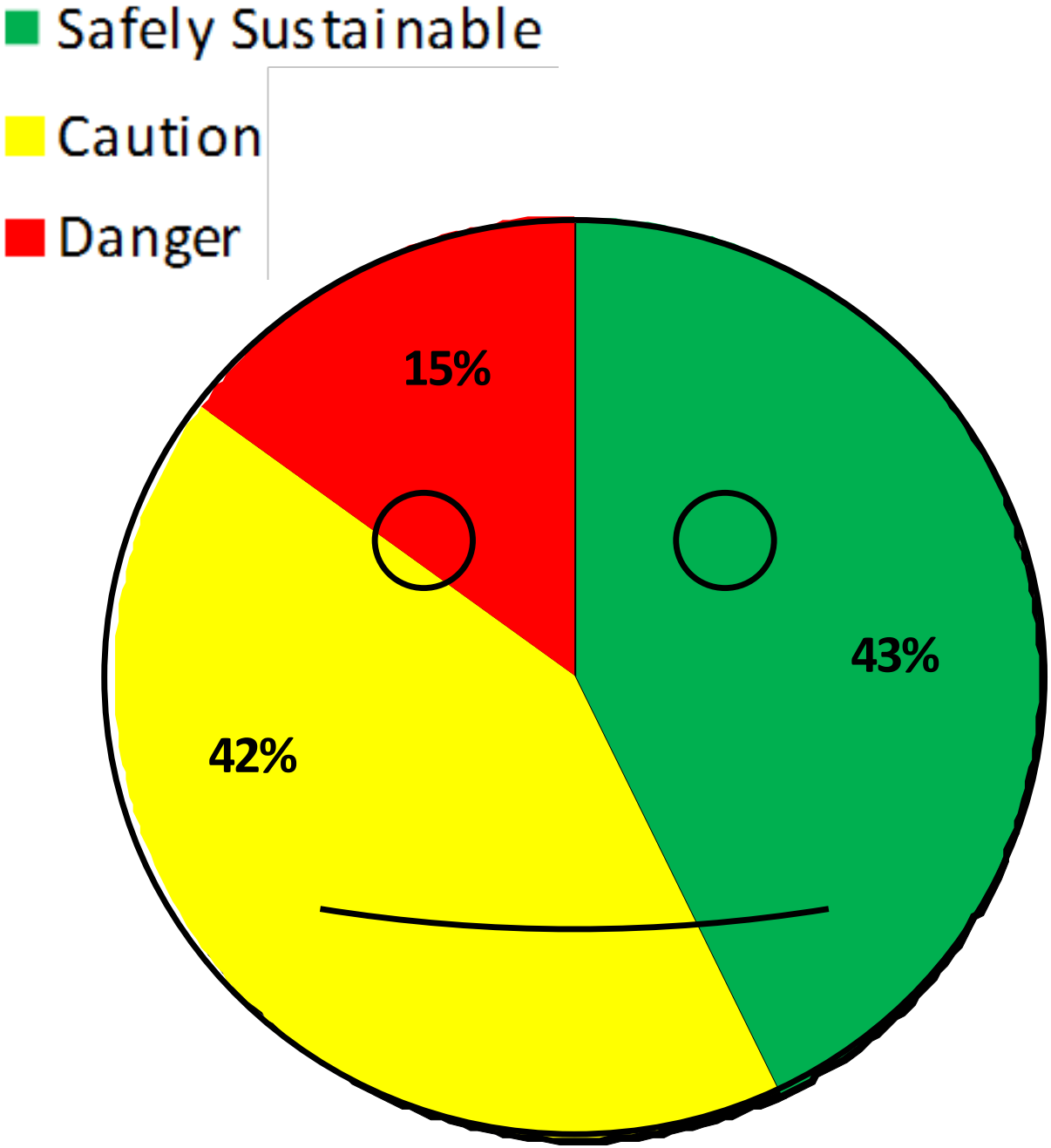
Stock Status Trajectories YFT



Current Stock Status




ASPIC
VPA
F2006/Fmsy
B2006/Bmsy
0
0.5
1
1.5
2
2.5
3
0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1 1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 1.9 2


Safely Sustainable
Caution
Danger
15%
43%
42%

ATLANTIC YELLOWFIN TUNA SUMMARY

Maximum Sustainable Yield (MSY)	~130,600 t [1] (124,100-136,500) ~146,600 t [2] (128,200-152,500)
2006 Yield [3]	108,160 t
Current Yield[3] (2009)	118,871 t
Replacement Yield (2006)	~ 130,000 t
Relative Biomass B_{2006}/B_{MSY}[4]	0.96 (0.72-1.22)
Relative Fishing Mortality: $F_{current(2006)}/F_{MSY}$[4]	0.86 (0.71-1.05)
$F_{current(2006)}/F_{0.1}$[5]	1.26 (1.11-1.44)
$F_{current(2006)}/F_{20\%SPR}$[5]	0.81 (0.73-0.93)
$F_{current(2006)}/F_{30\%SPR}$[5]	1.12 (1.01-1.29)
$F_{current(2006)}/F_{40\%SPR}$[5]	1.52 (1.35-1.73)

Management measures in effect:

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

NOTE: $F_{current(2006)}$ refers to F_{2006} in the case of ASPIC, and the geometric mean of F across 2003-2006 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.

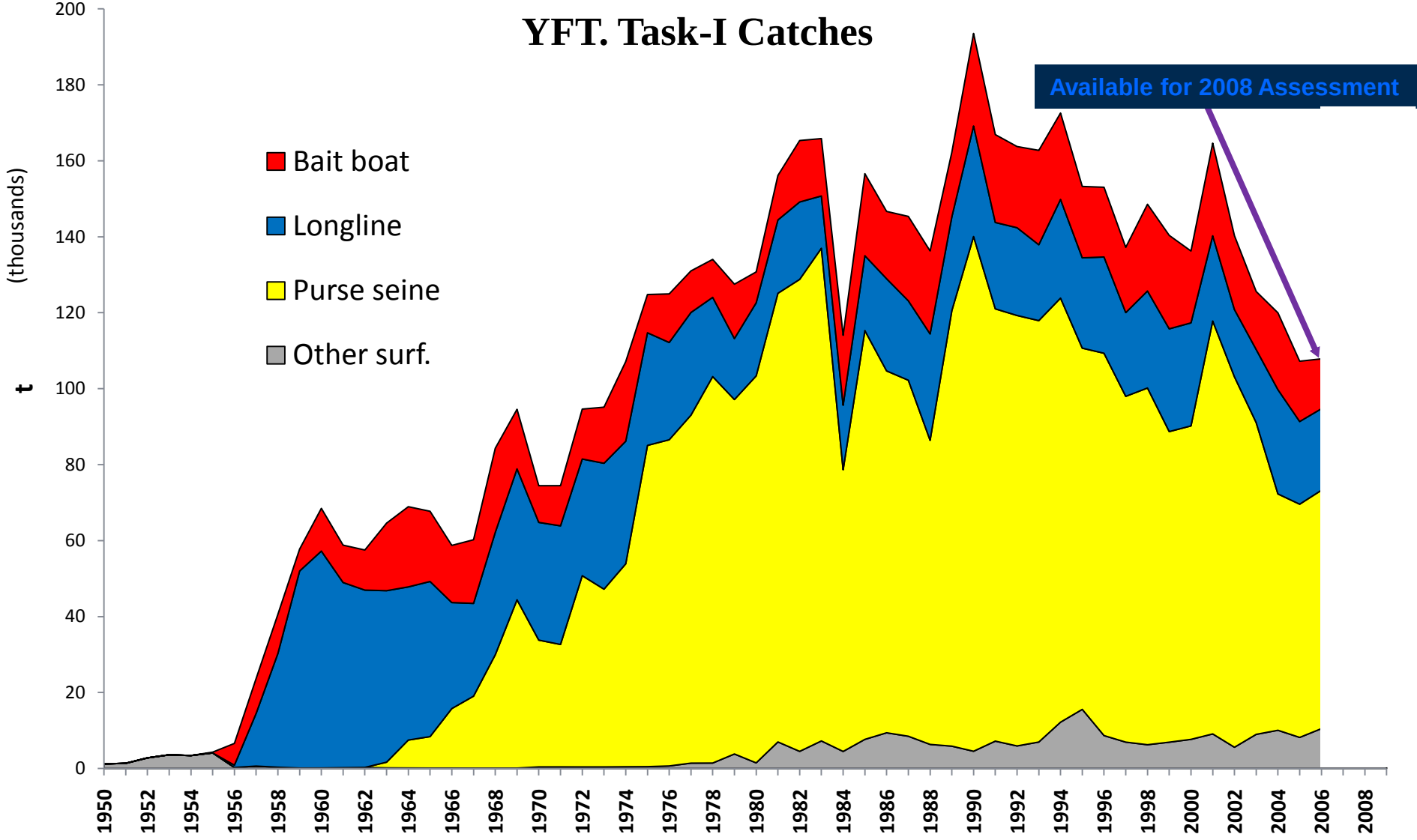
[1] Estimates (with 80% confidence limits) based upon results of the age-structured model (VPA).

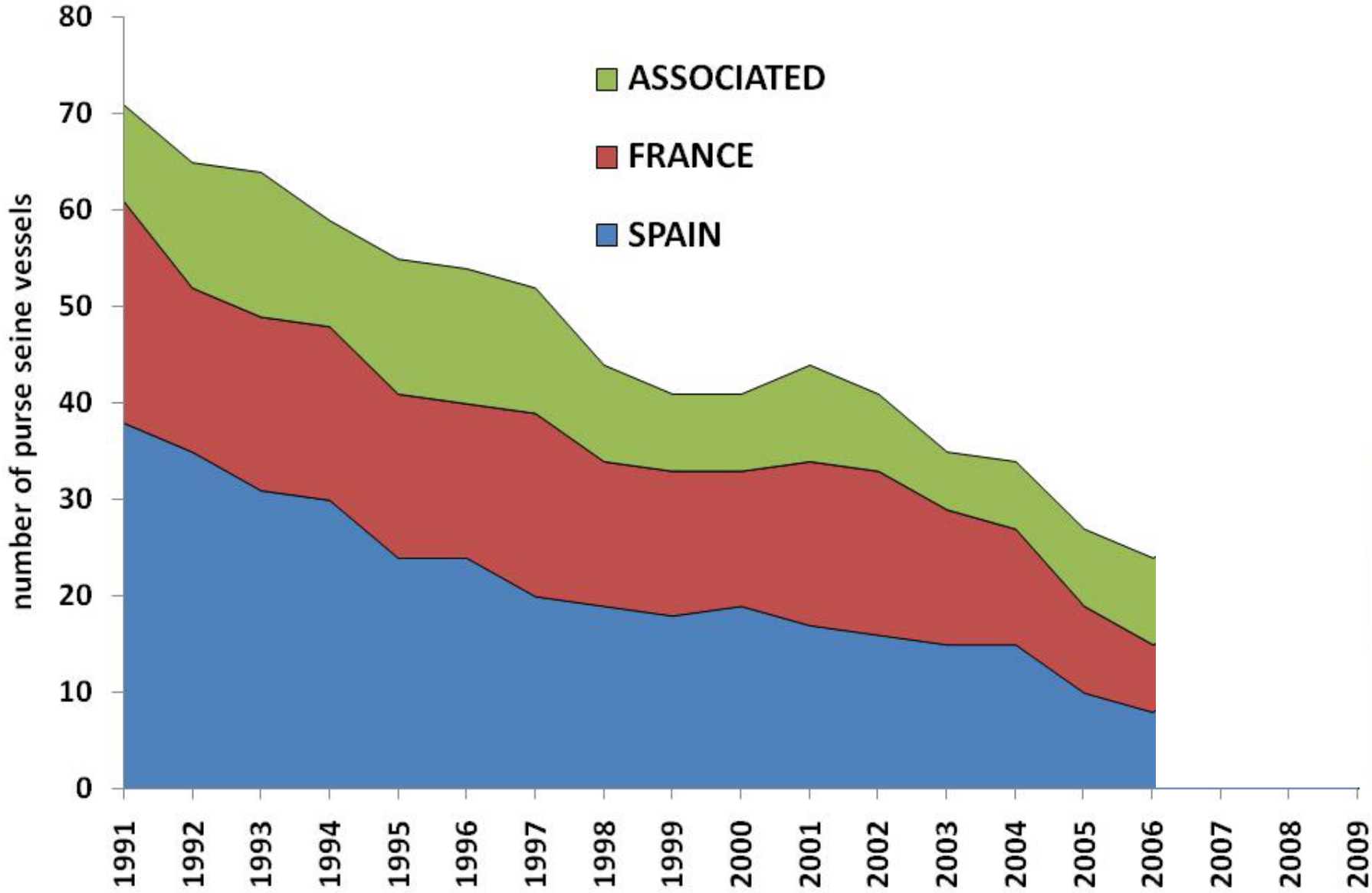
[2] Estimates (with 80% confidence limits) based upon results of the non-equilibrium production model (ASPIC).

[3] The assessment was conducted using the available catch data through 2006. Subsequent revisions have reduced reported catch levels slightly to 107,859 t.

[4] Median (25th-75th percentiles) from joint distribution of age-structured and production model bootstrap outcomes considered.

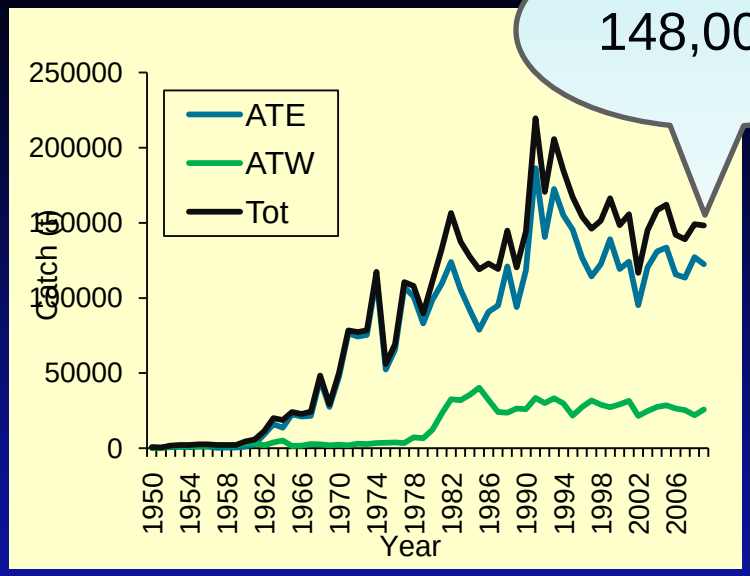
[5] Result exclusively from VPA and yield-per-recruit analyses.


YFT. Task-I Catches
Available for 2008 Assessment
Bait boat
Longline
Purse seine
Other surf.
t (thousands)
0
20
40
60
80
100
120
140
160
180
200
1950
1952
1954
1956
1958
1960
1962
1964
1966
1968
1970
1972
1974
1976
1978
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008


ASSOCIATED
FRANCE
SPAIN
number of purse seine vessels
0
10
20
30
40
50
60
70
80
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009

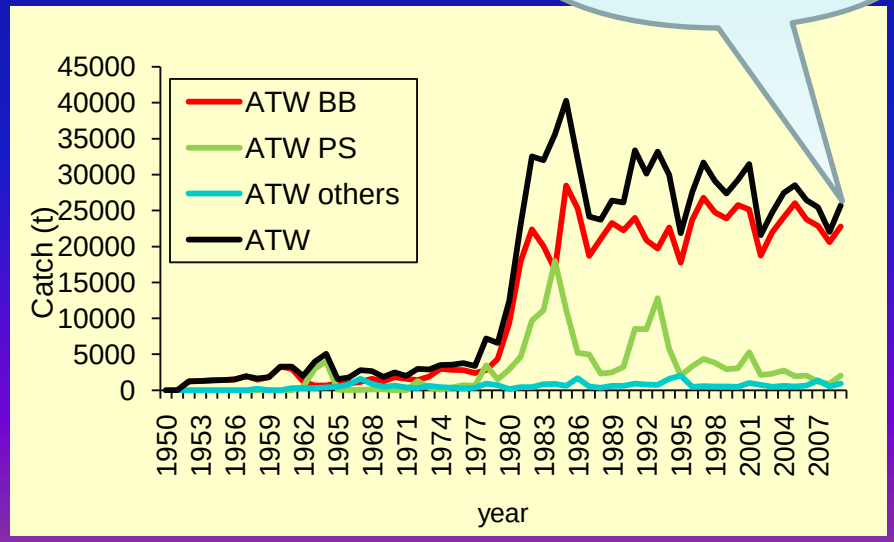
SKJ

148,000 t

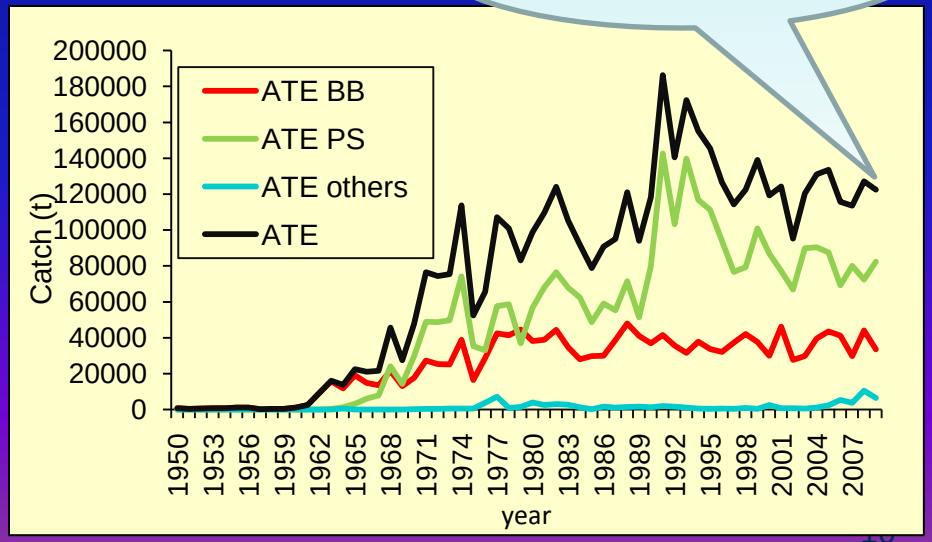


- Decline in catch (except for the most recent years) due to a decrease in nominal fishing effort and/or to a moratorium effect,
- Catchability of SKJ increased in the early 1990s due to FADs fishing

26,000 t

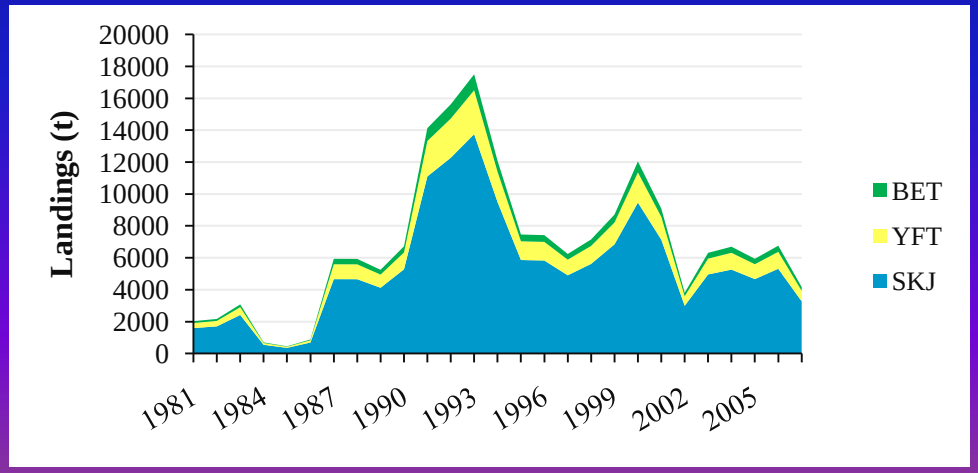


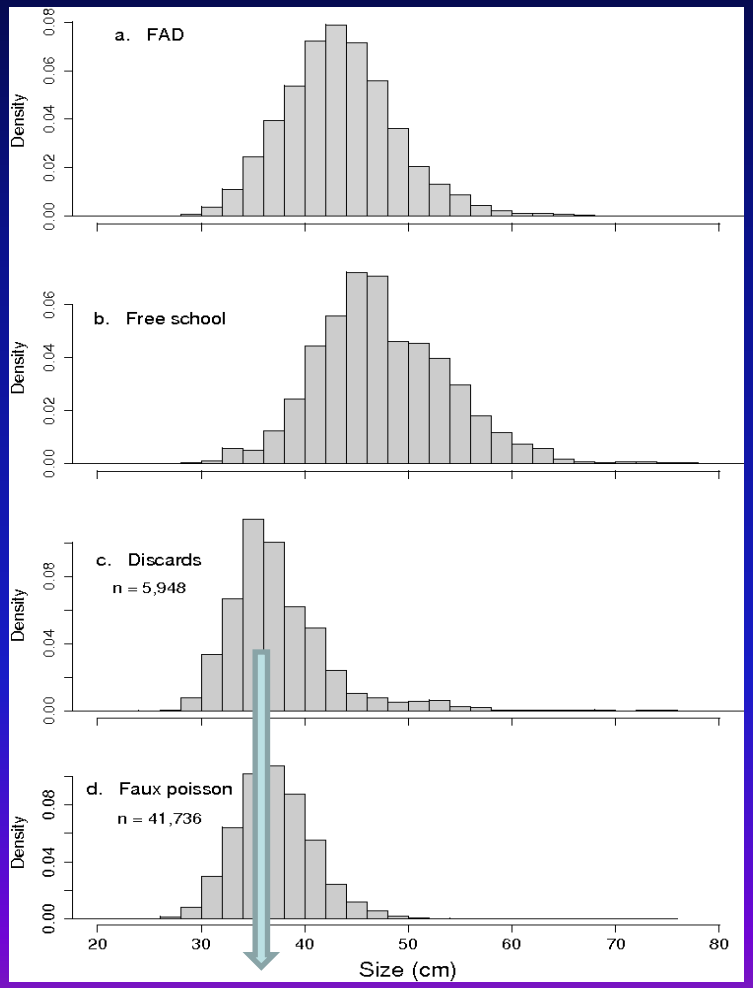
122,000 t



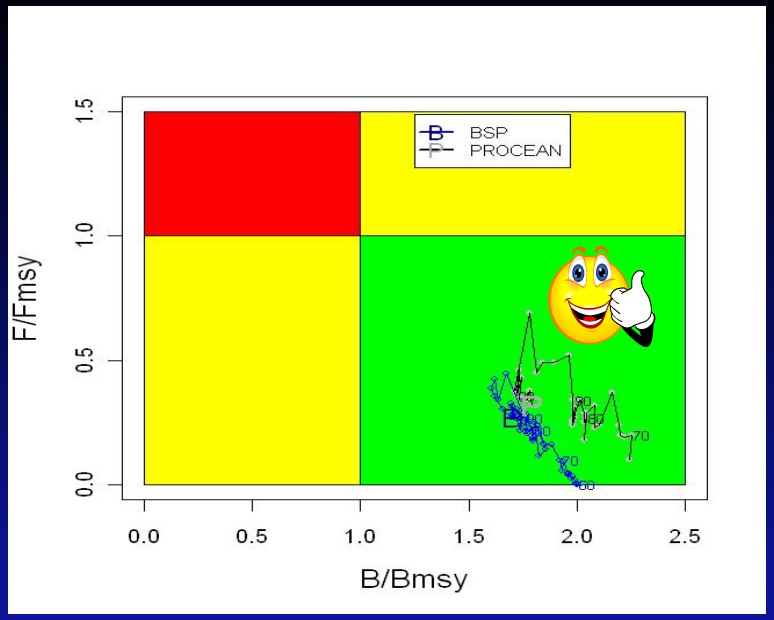
Estimate of the small skipjack landed as “faux-poisson” in the local market of Abidjan in Côte d’Ivoire

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





37 cm

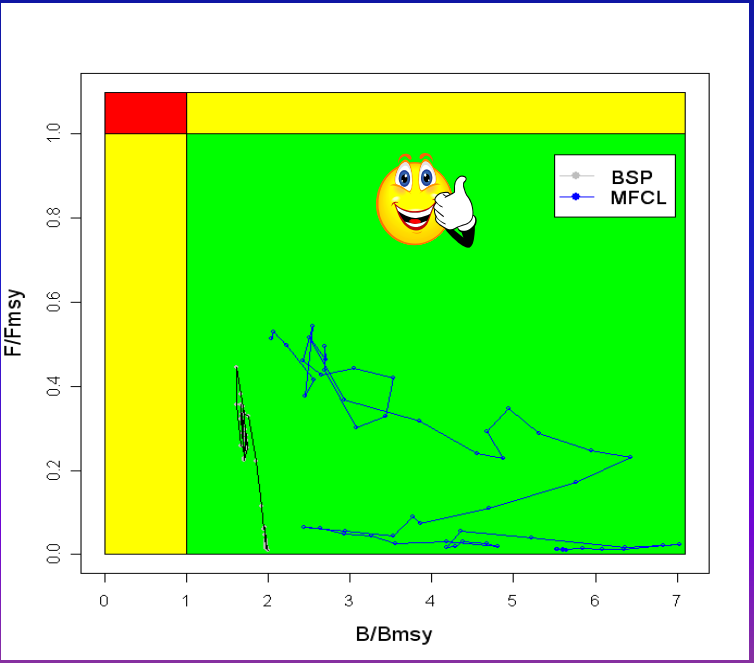


State of the Eastern Atlantic SKJ (conducted in 2008 with fisheries information through 2006)

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	**122,000 t**
Average recent catches (5 years)	124,000 t

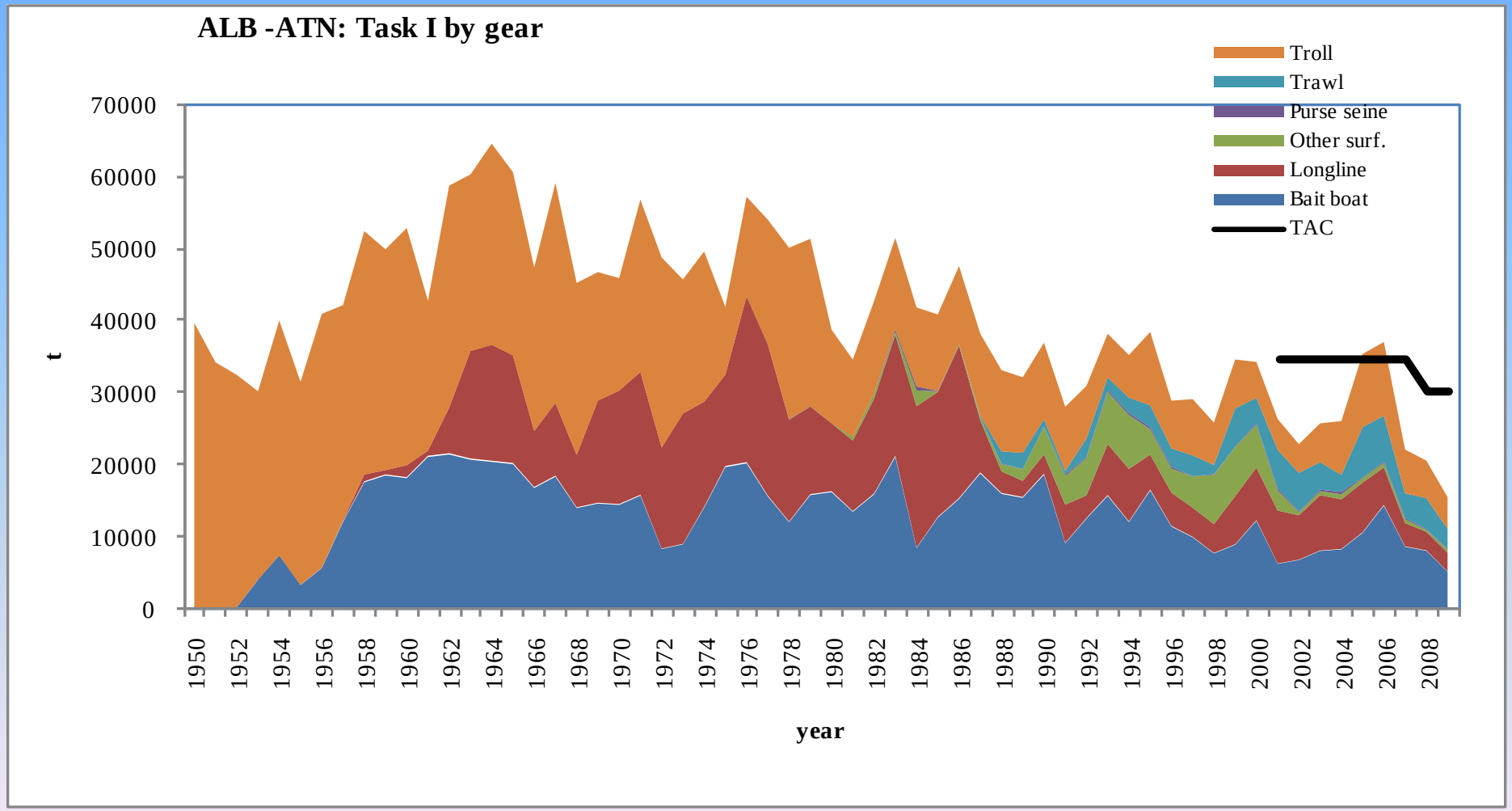
Model type	MSY
RRIC (G & G index)	30,000 t
Catch only model (Schaefer form)	30,000 t
MULTIFAN-CL	31,000 t– 36,000 t
BSP (Schaefer form)	34,000 t
Current Catch	**26.000 t**
Average recent catches (5 years)	26,000 t

State of the Western Atlantic SKJ (conducted in 2008 with fisheries information until 2006)

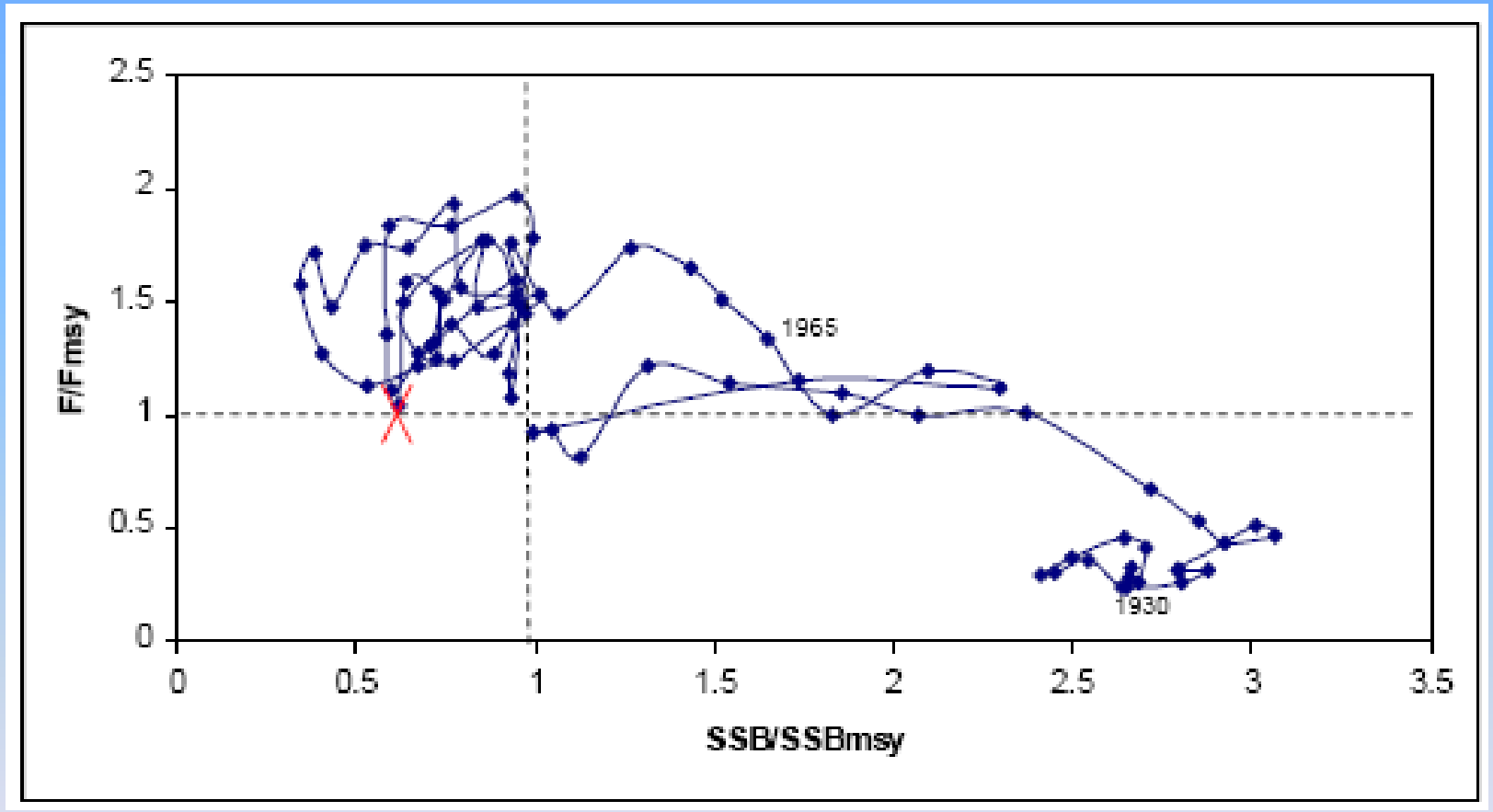


Albacore Fisheries

Task I catch. North Atlantic stock



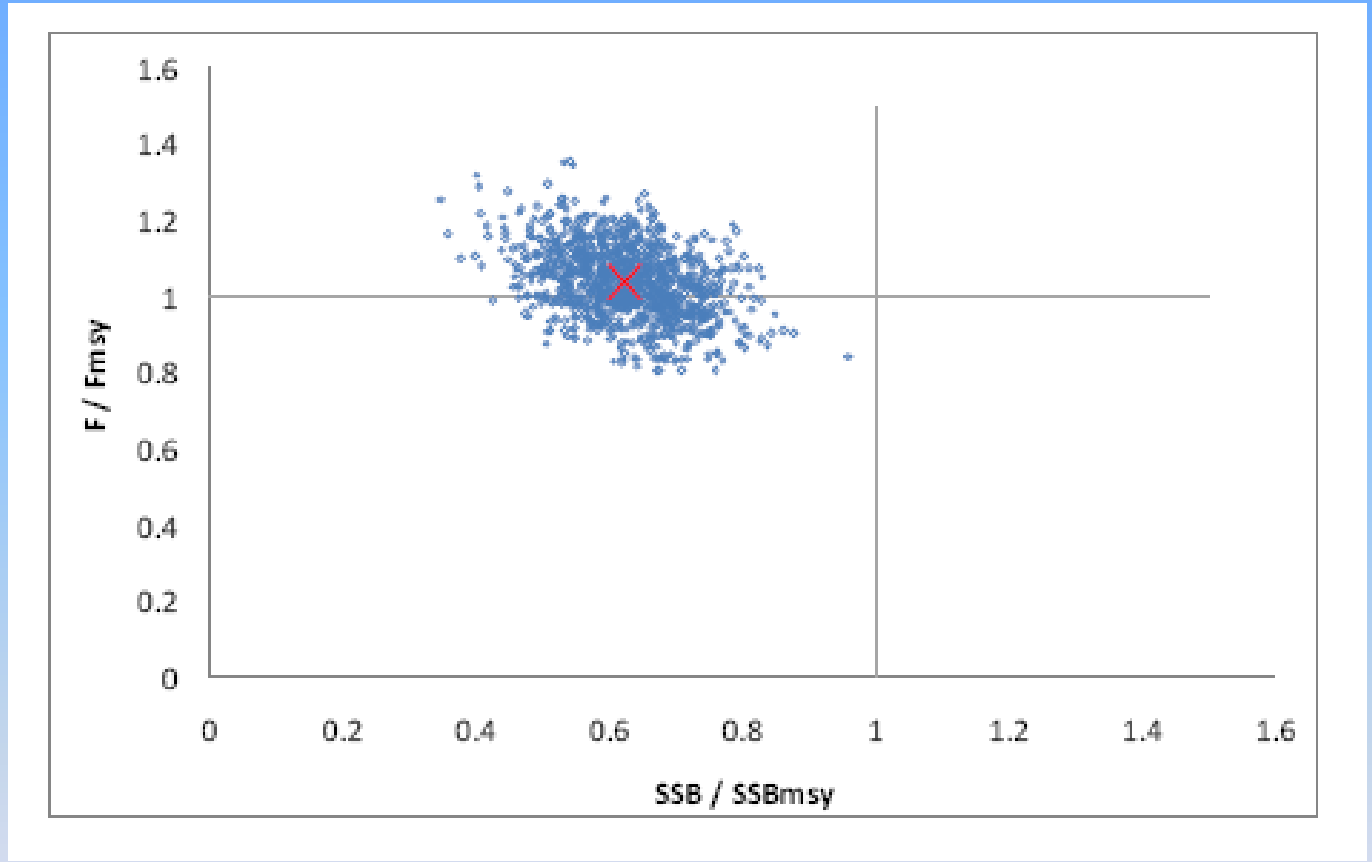
ALB- N- Relative F, SSB and status stock relative to MSY- MFCL base model 2009



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

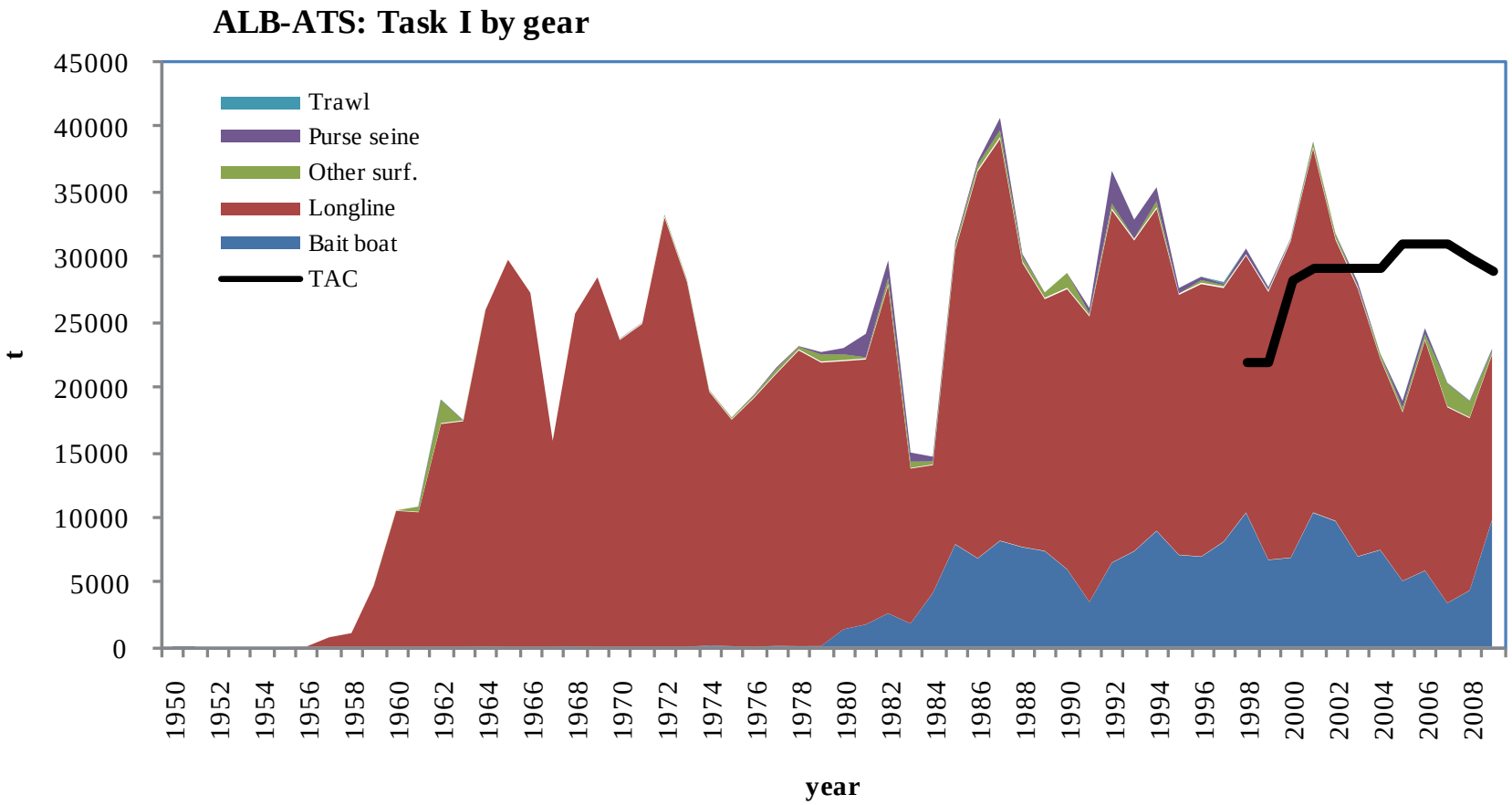


Uncertainty in current stock status for northern albacore 2007 status

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

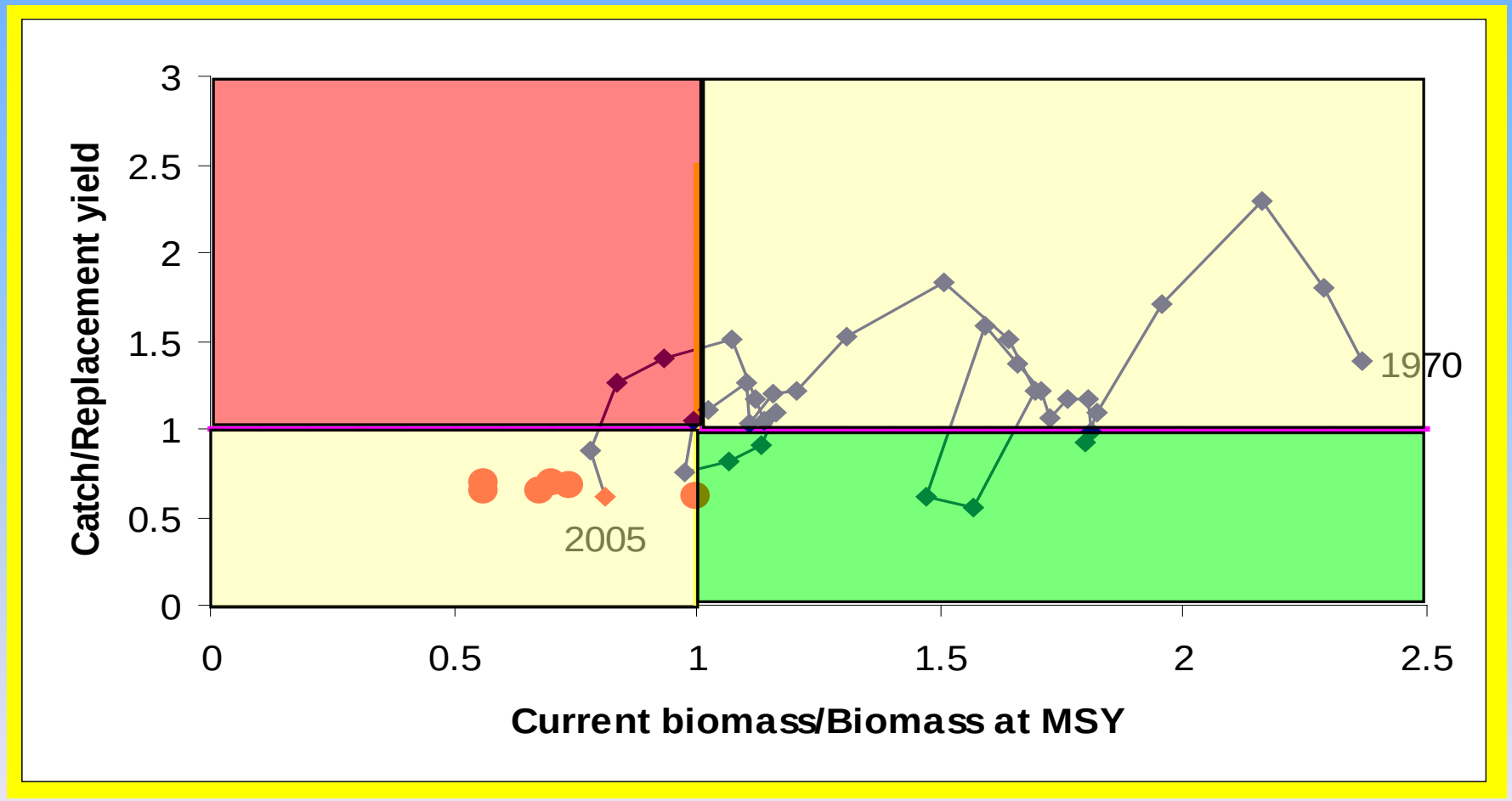
Albacore Fisheries

Task I catch. South Atlantic stock



ALB- South Atlantic

Catch relative to replacement yield and Biomass/Bmsy trajectory in 2005 status



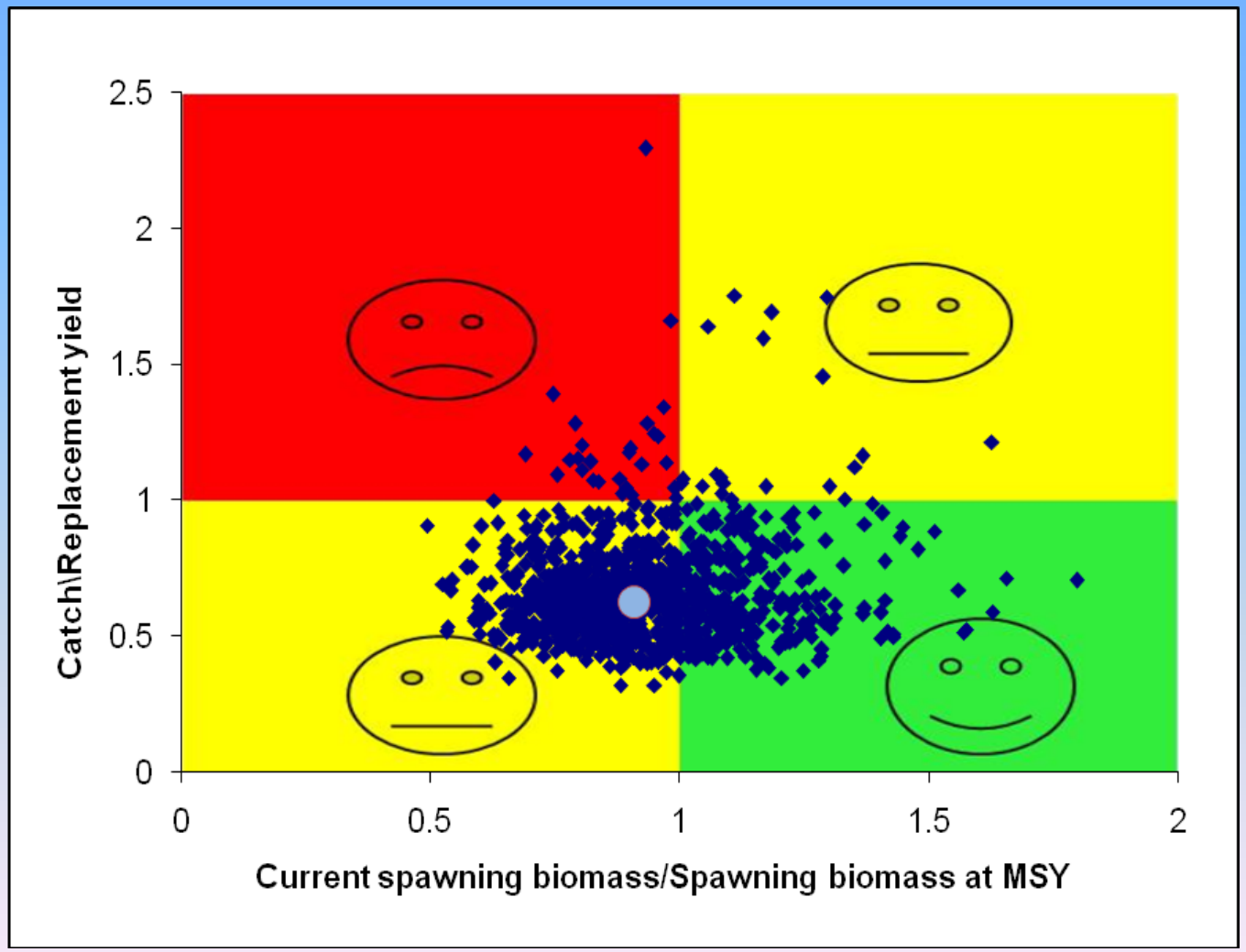
- 2005 status estimated from sensitivity runs

ALB- South Atlantic
Uncertainty of 2005 status determination

2005 status

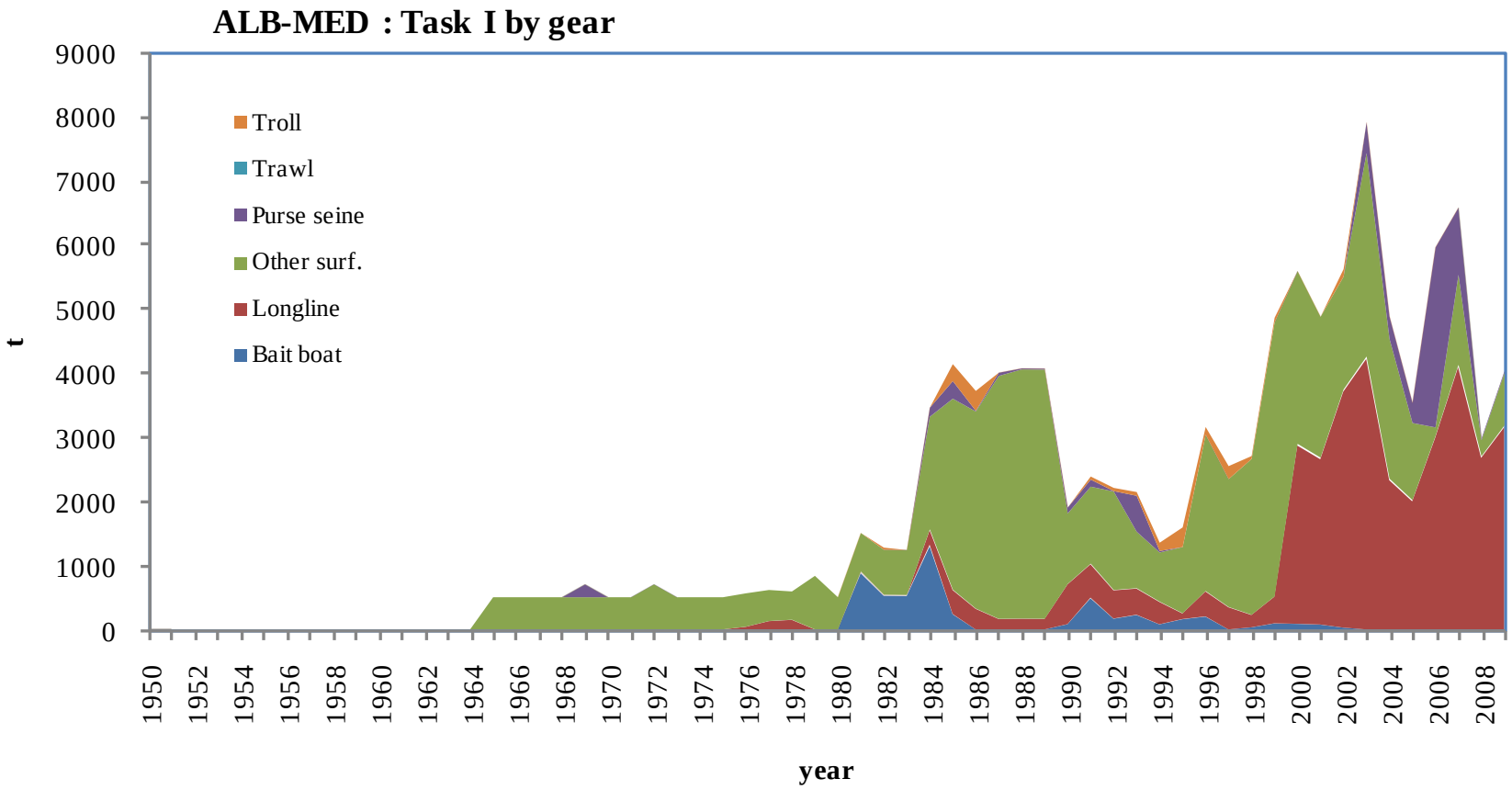
F/Fmsy =0.63

SSB/Bmsy = 0.9



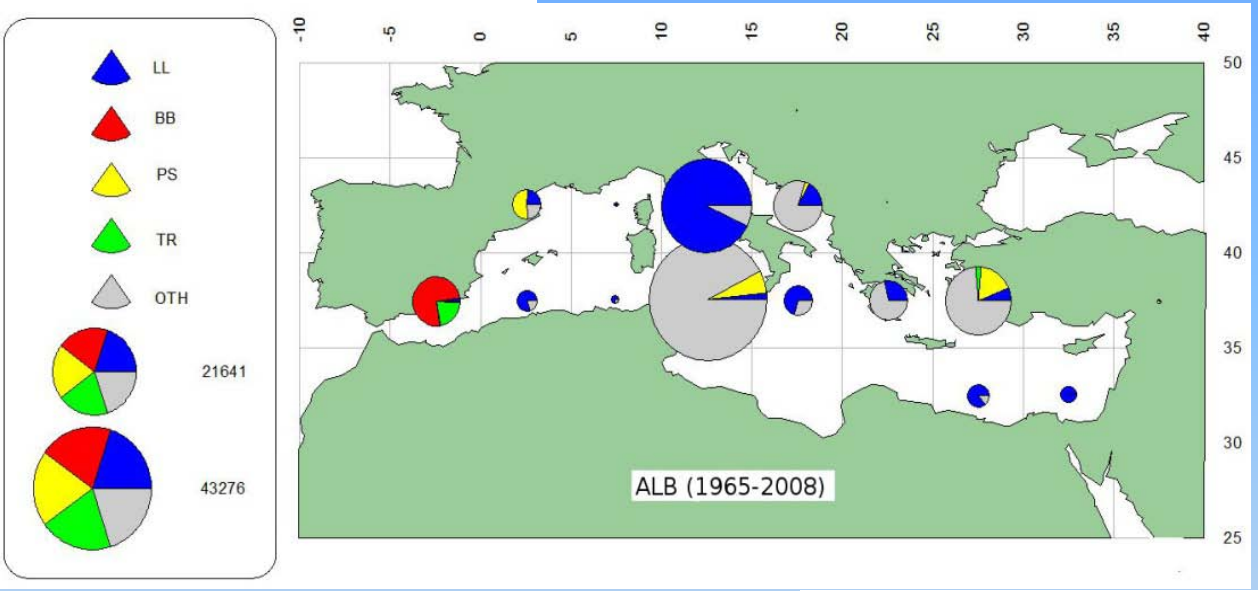
Albacore Fisheries

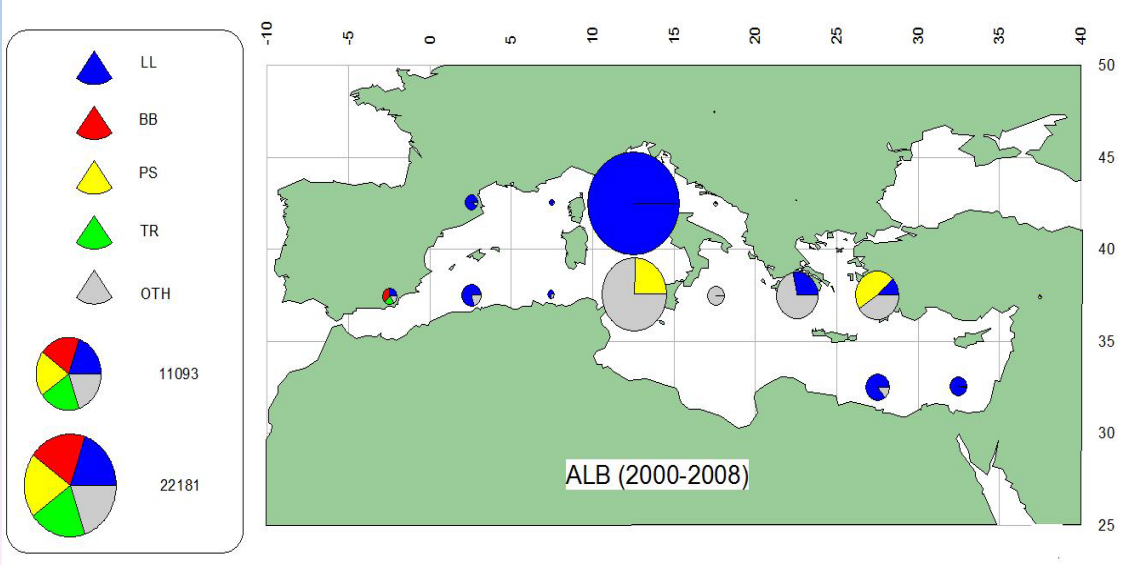
Task I catch. Mediterranean stock



Albacore Fisheries

Mediterranean stock





Mediterranean Albacore stock data Preparatory Meeting, July 2010

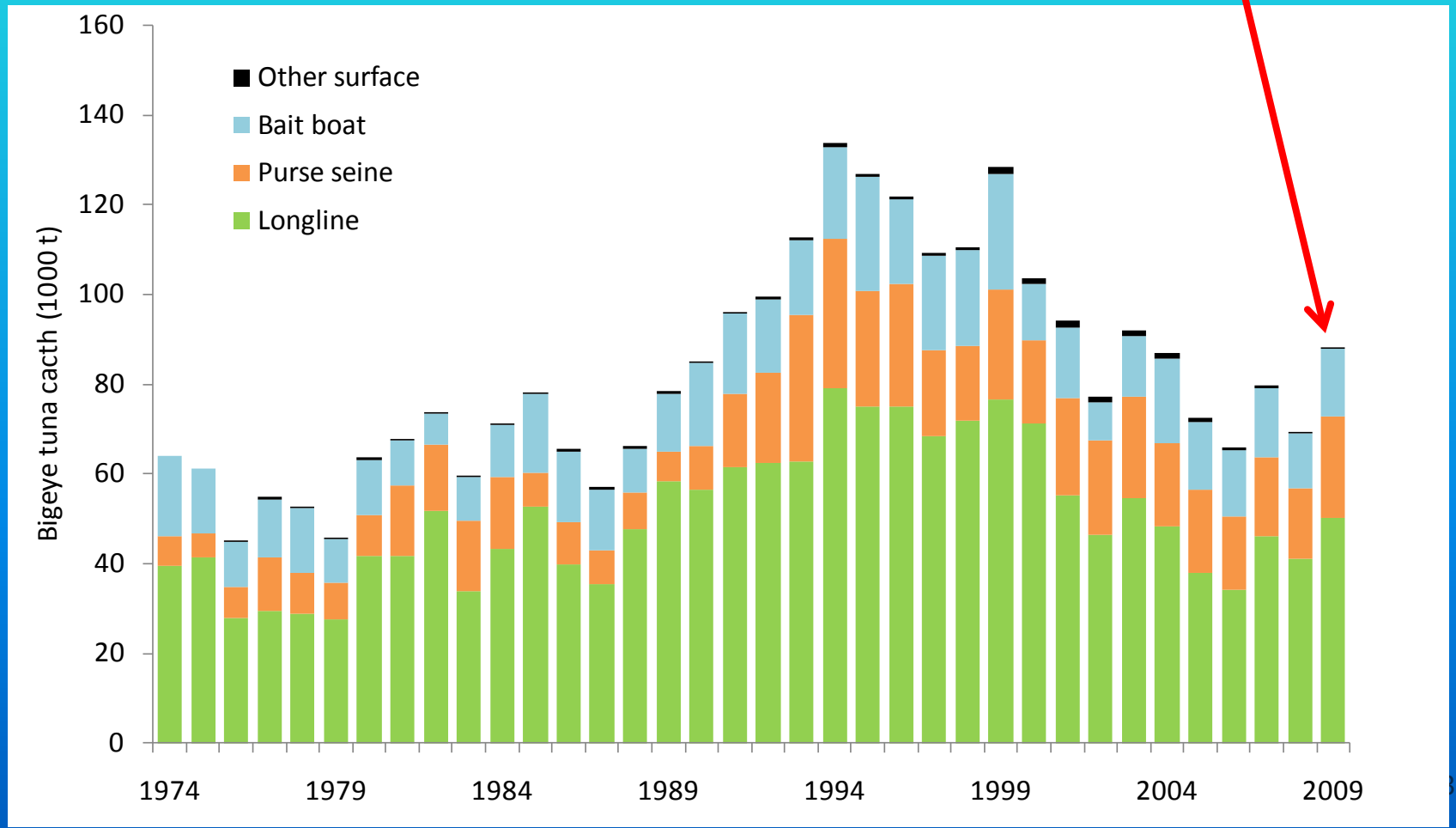
Results from review of available data:

- **Deficiencies identified in Task I (catch) and Task II (catch, effort, and size) data by fleet and gear.**
- **No CPUE´s from commercial fleet are available, only information on sport vessel catch rates around Balearic Is.**
- **Considering that biological data have been collected through different data collection programs (e.g. EU/DCR), a concerted effort to consolidate these data in an appropriate form for analyses is recommended.**

Bigeye Tuna Assessment 2010

The number of purse seiners operating in 2009 and 2010 was similar to the number operating in 2003-04

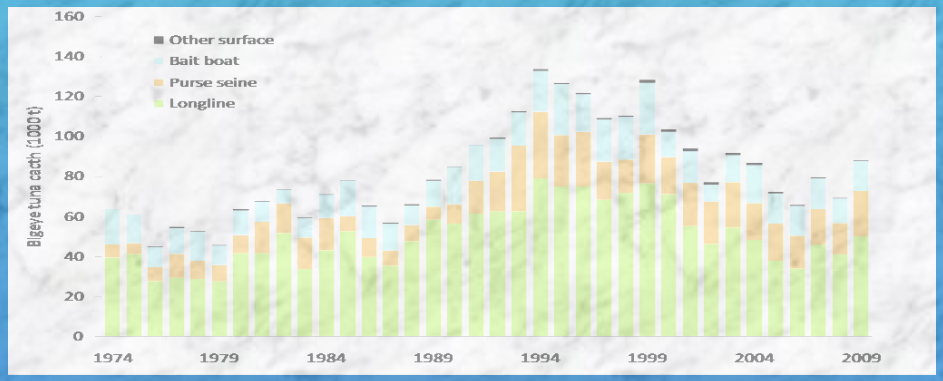
The preliminary estimate for 2009 is 86,025 t, the highest value in the last five years.



Some catch statistics are uncertain

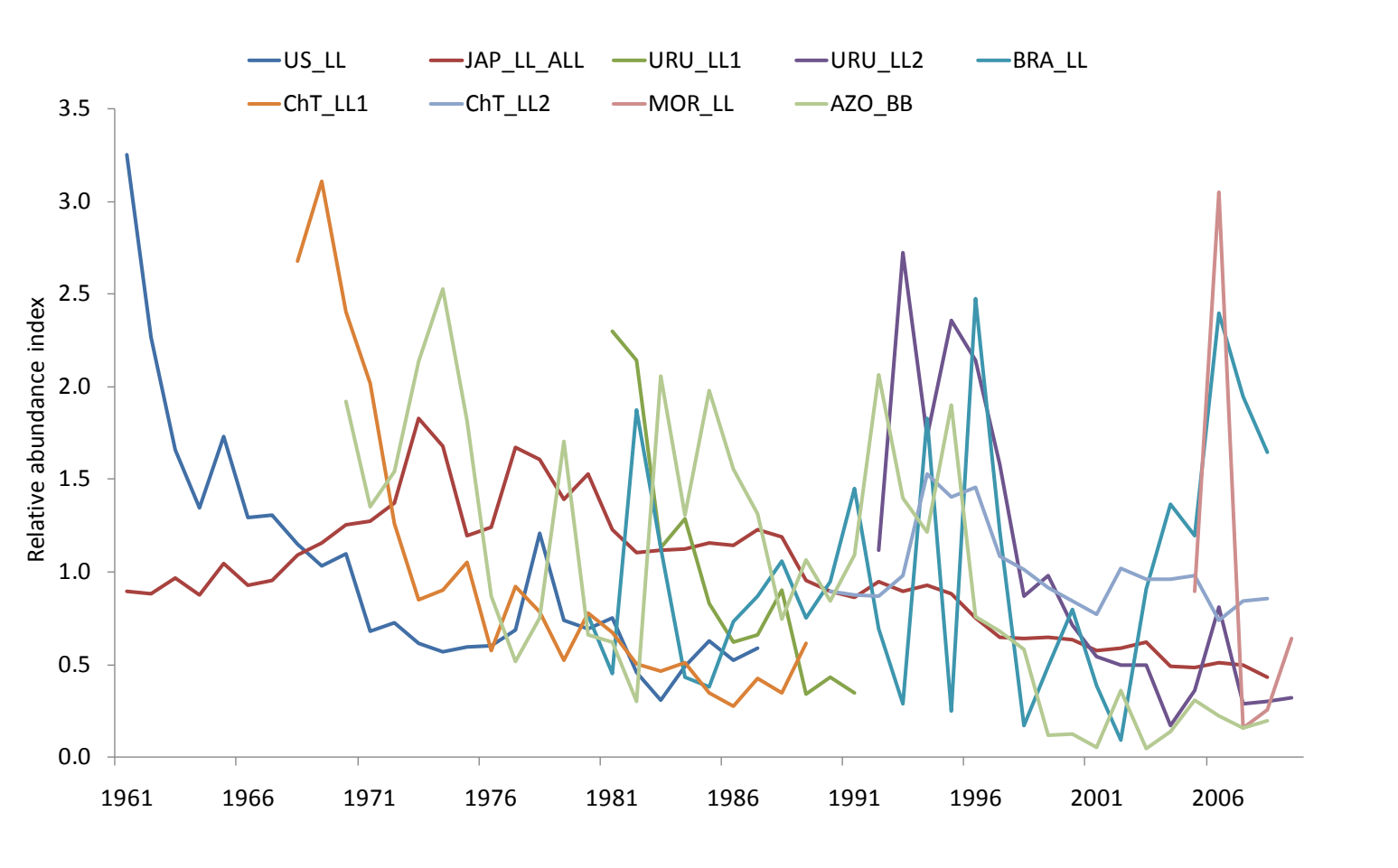
- IUU longline catches - estimated from Japanese import statistics - but estimates are considered uncertain
- Significant catches of small bigeye tuna continue to be channeled to local West African markets and sold as “faux poisons”.

Monitoring of such catches has progressed in some countries but there is still a need for a coordinated approach that will allow ICCAT to properly account for these catches

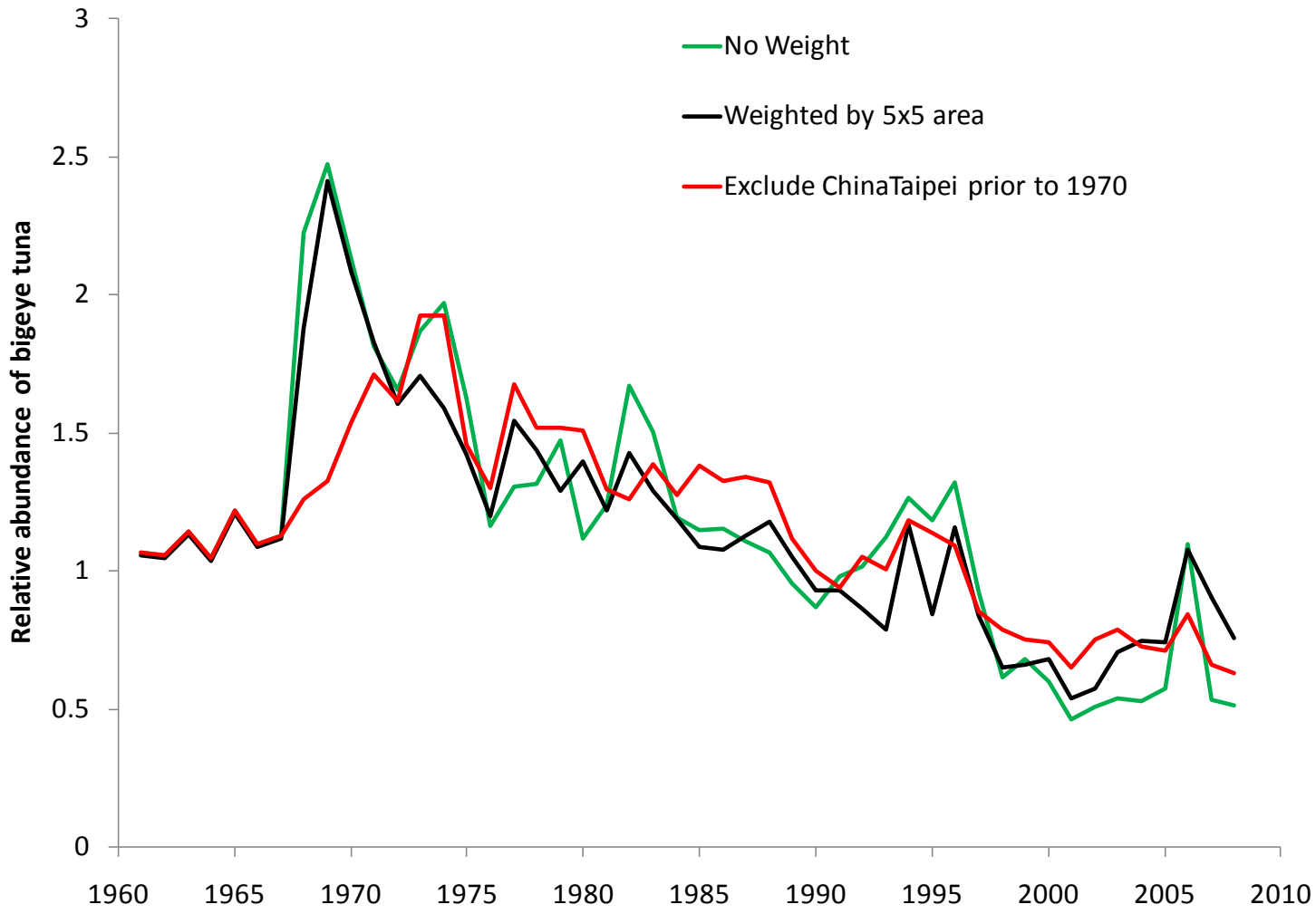


Relative abundance indices

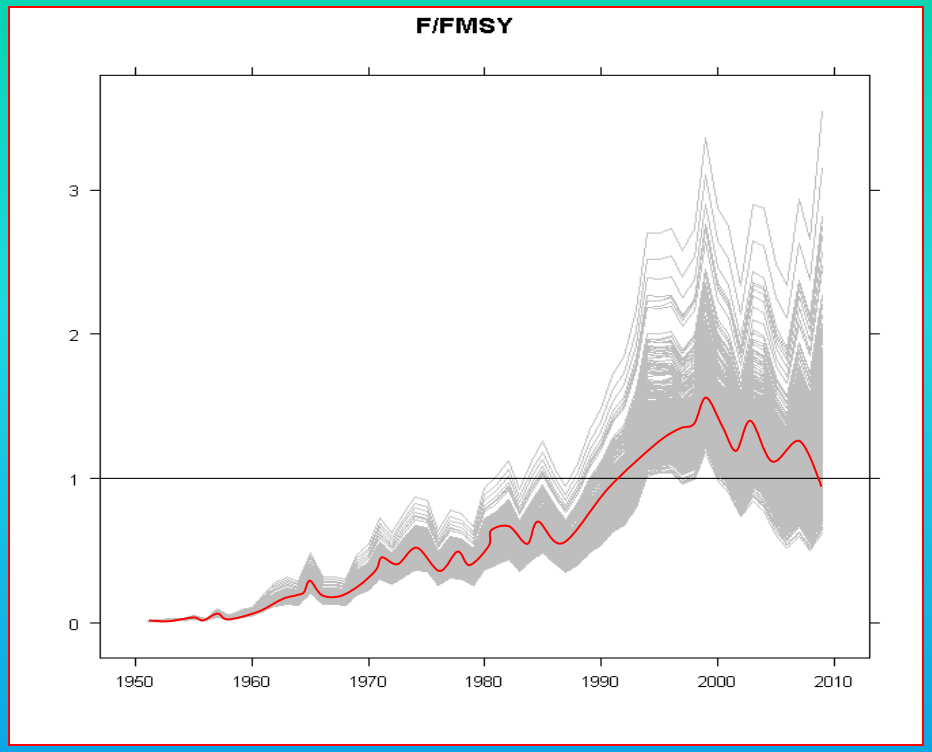
6 from Longline fleets and 1 from Baitboat fleet

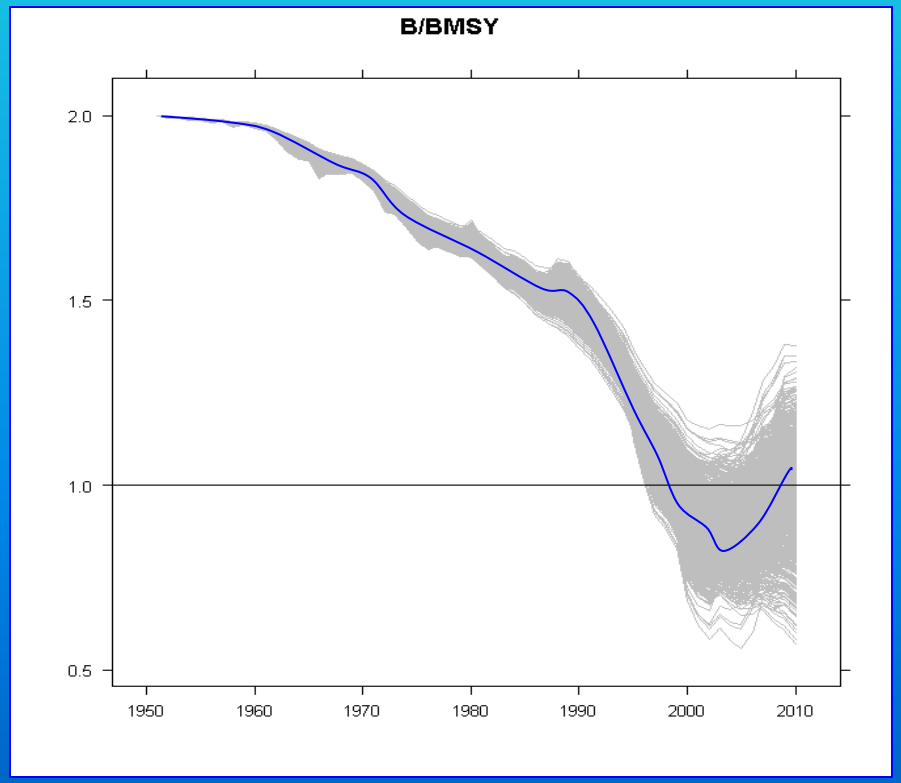


Combined relative abundance indices used in the logistic production model

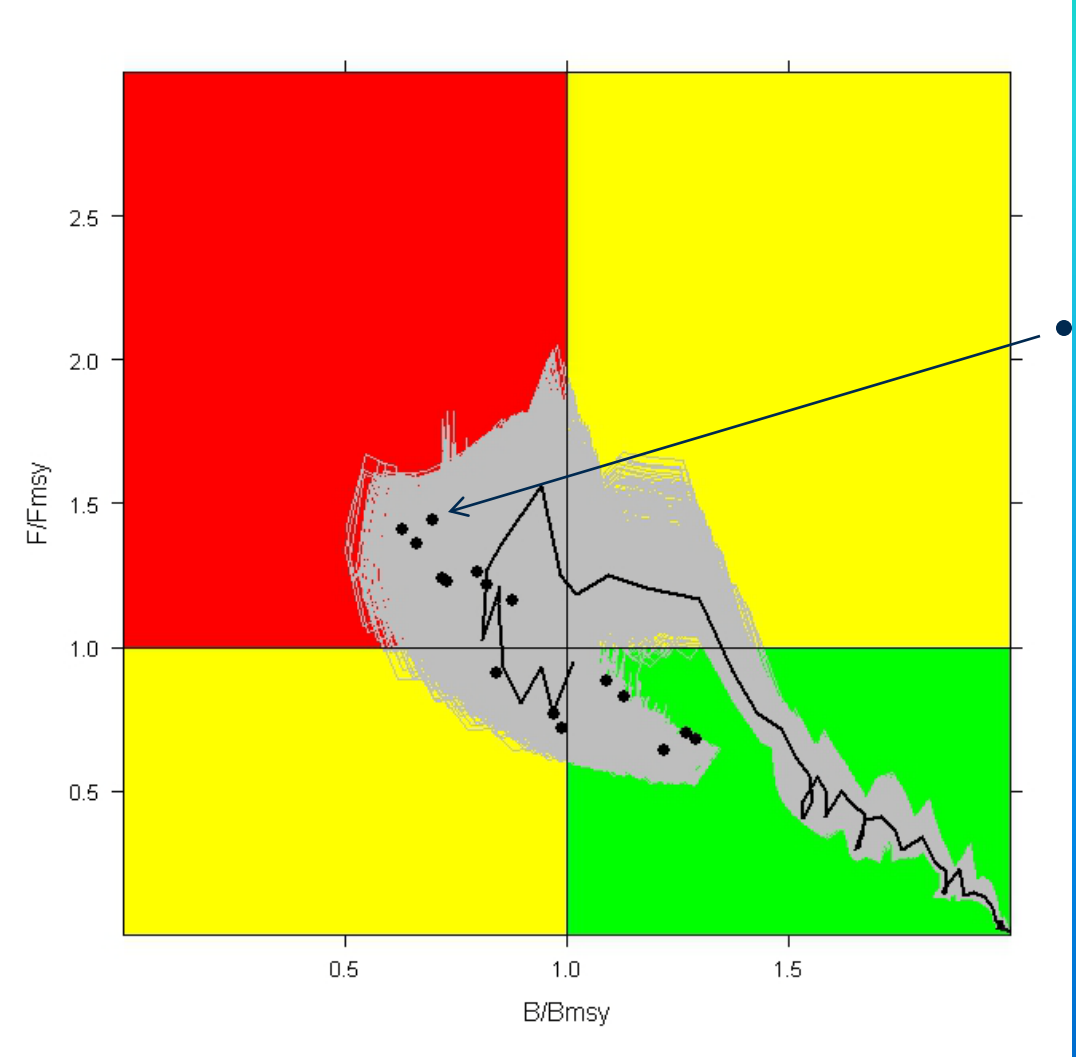


F/F_{MSY} and B/B_{MSY} estimated from the logistic production model





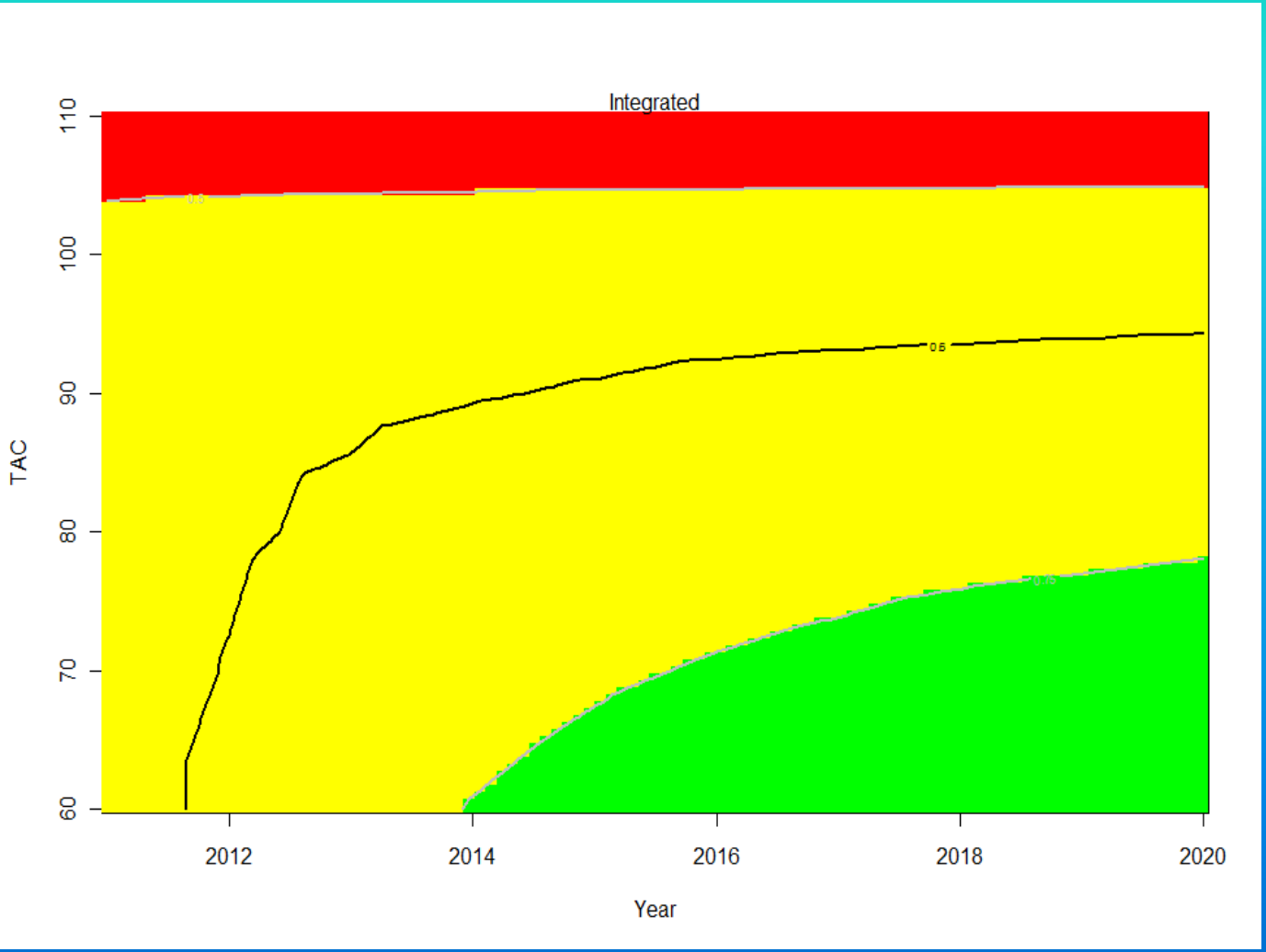
There is considerable uncertainty in the assessment of stock status and productivity for bigeye



Terminal year status from all other models considered in the assessment:

- ❑ Bayesian production models
- ❑ VPA
- ❑ Multifan CL
- ❑ SS3

Kobe matrix plot showing 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

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**
- **Replacement yield close to current catches**
- **Outlook optimistic if Commission continues with current effort to limit catches so as to maintain the stock at levels that are consistent with the objectives of the commission**

Executive summary table BET

ATLANTIC BIGEYE TUNA SUMMARY	
Maximum Sustainable Yield	78,700-101,600 t (median 92,000 t) [1,2]
Current (2009) Yield[1]	86,000 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]

Tropical Tunas Work Plan for 2011

- **No stock assessment(s) are planned for yellowfin tuna, bigeye tuna or skipjack tuna in 2011.**

- **Update the fishery indicators for all three stocks in 2011.**

- ***Noting the ongoing difficulties posed by inadequacies in the data for the eastern tropical purse seine fisheries, in particular the Ghanaian statistics as well as the accounting of "faux poisson",***

A working group will be formed to examine the available Ghanaian data, sampling and reporting programs in detail, as well as the relevant programs in Côte d'Ivoire for estimating "*faux poisson".*

- o **Analyze Ghanaian Task I and Task II (including size data), specifically in a comparative approach with the EU purse seine fishery operating in the same fishing grounds.**
- o **Propose a sampling scheme as close as possible as the protocol used in the EU fishery and rebuilding past Ghanaian statistics, if necessary, based on the comparative analysis.**

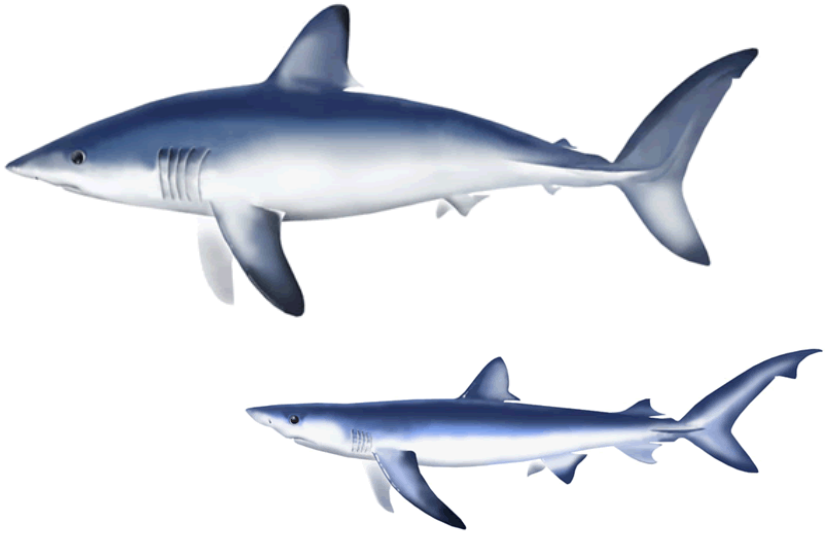
NOAA
FISHERIES
SERVICE

SCRS BAYS Recommendations

- Recommends 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.
- Recommends a broad-scale, stock wide tagging program for bigeye, yellowfin and skipjack (anticipated cost = 11.4 million Euros). 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 is supportive of research programs to mitigate by-catch in purse seine fisheries (especially on FADs), such as the program that ISSF has initiated. Since some issues and potential solutions are region-specific, part of the research should be conducted in the Atlantic Ocean.
- In order for scientists to access the cannery data that ISSF participating companies are submitting to the Secretariat (so that data, such as the estimates of catch by species, can be improved) the Committee encourages the development of Memos Of Understanding that will permit access while protecting the confidential components of the ISSF data submissions.

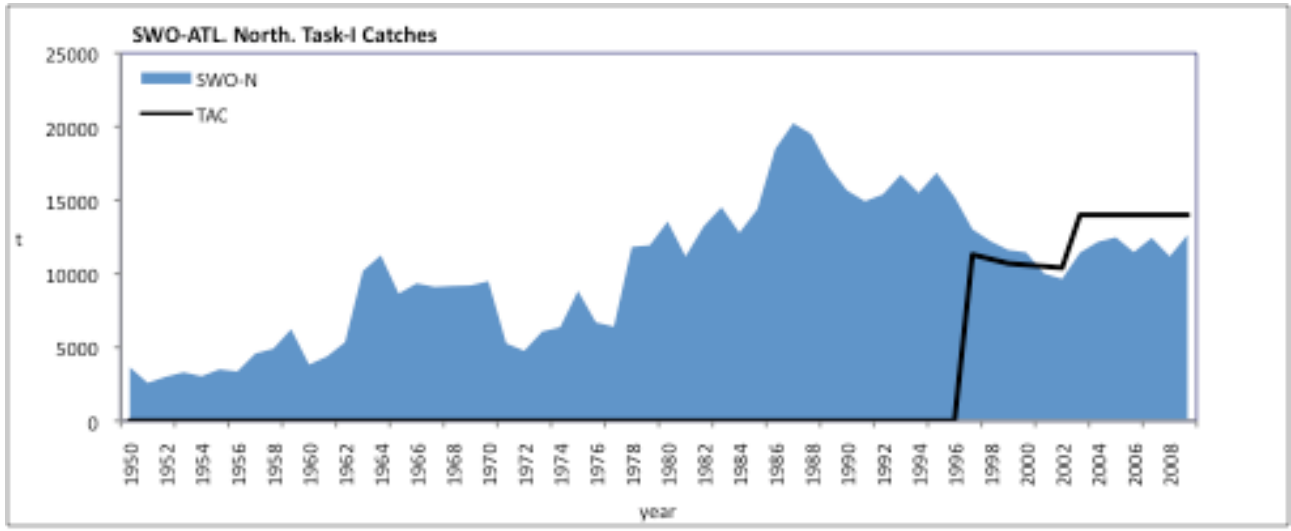
NOAA
FISHERIES
SERVICE

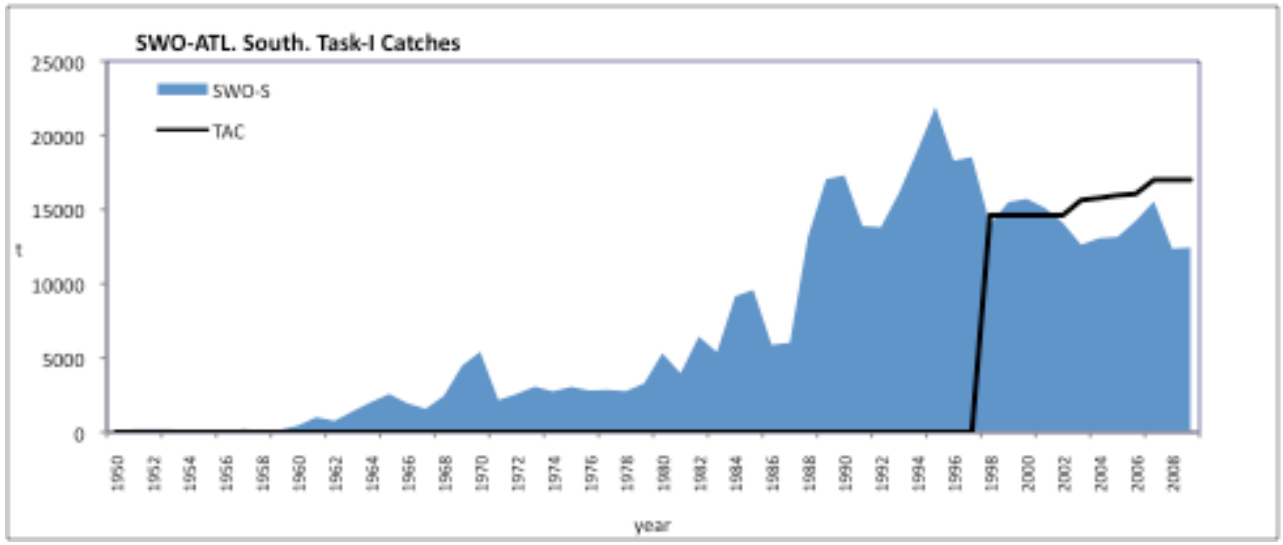
Swordfish/Shark Working Group



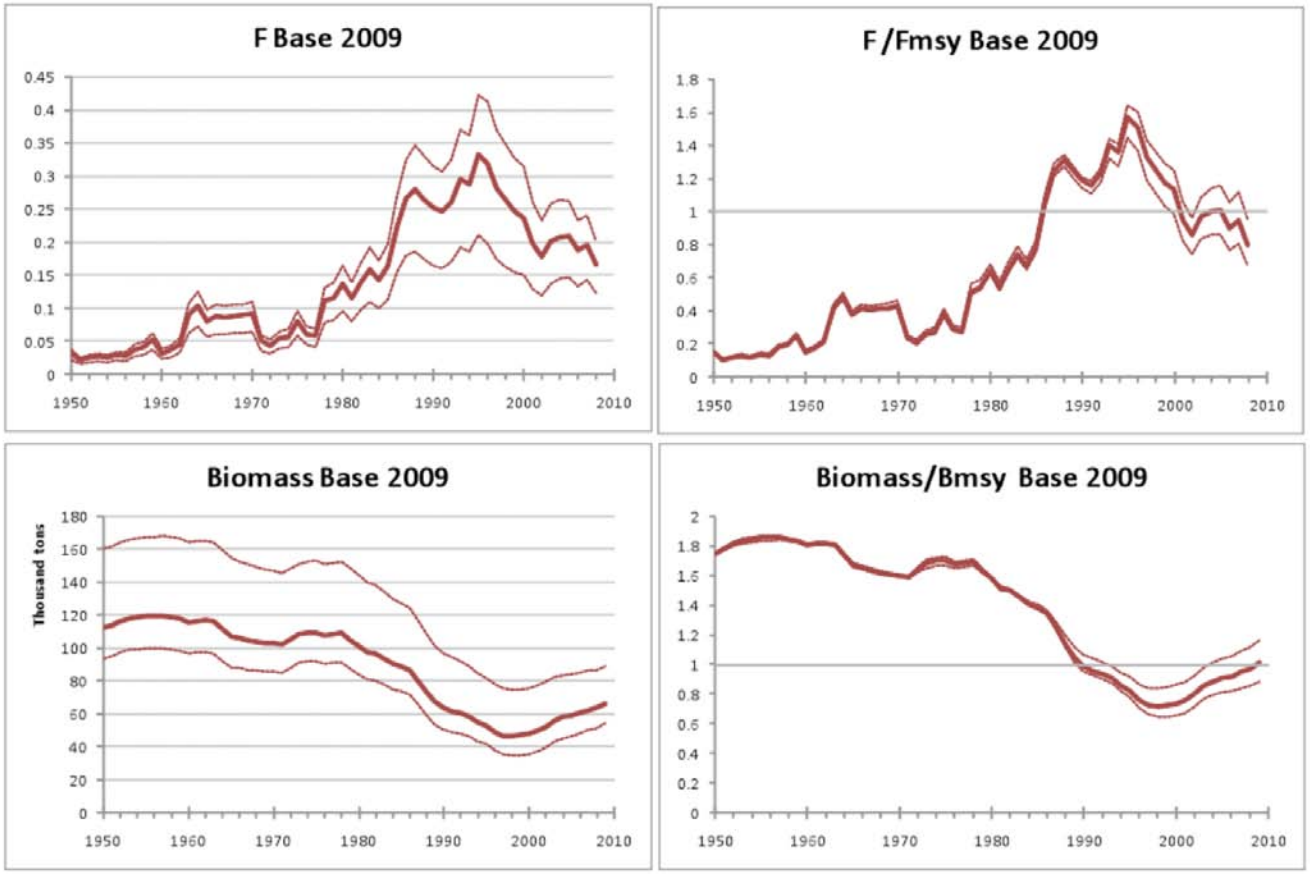
Landings in Relation to TAC, North and South.

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





ASPIC Production Model Results, North.

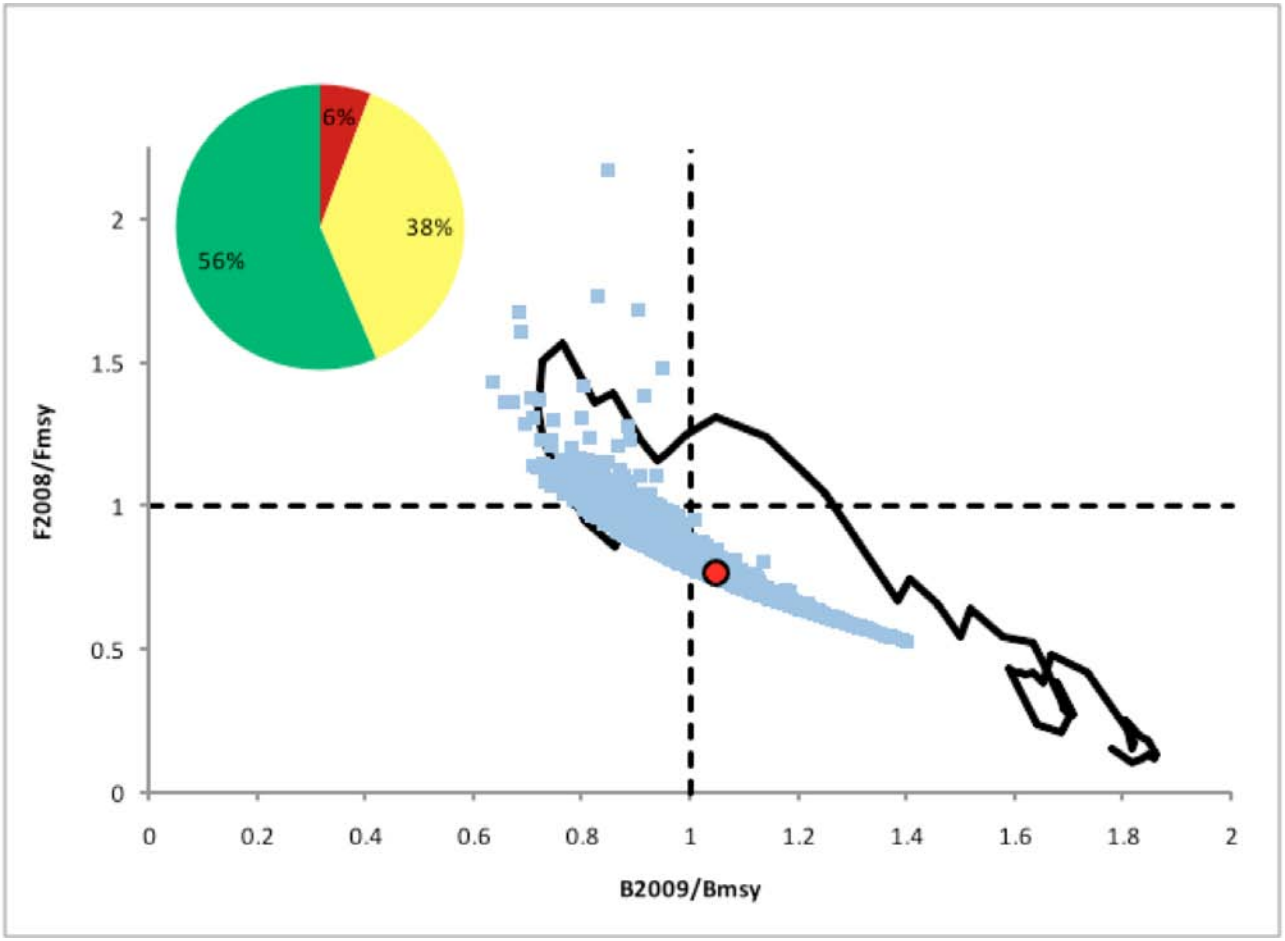


The current results indicate that the stock is at or above B_{MSY}.

Fishing mortality has been below F_{MSY} since 2005.

These results generally supported by Bayesian Surplus Production and VPA.

Stock Status, North.

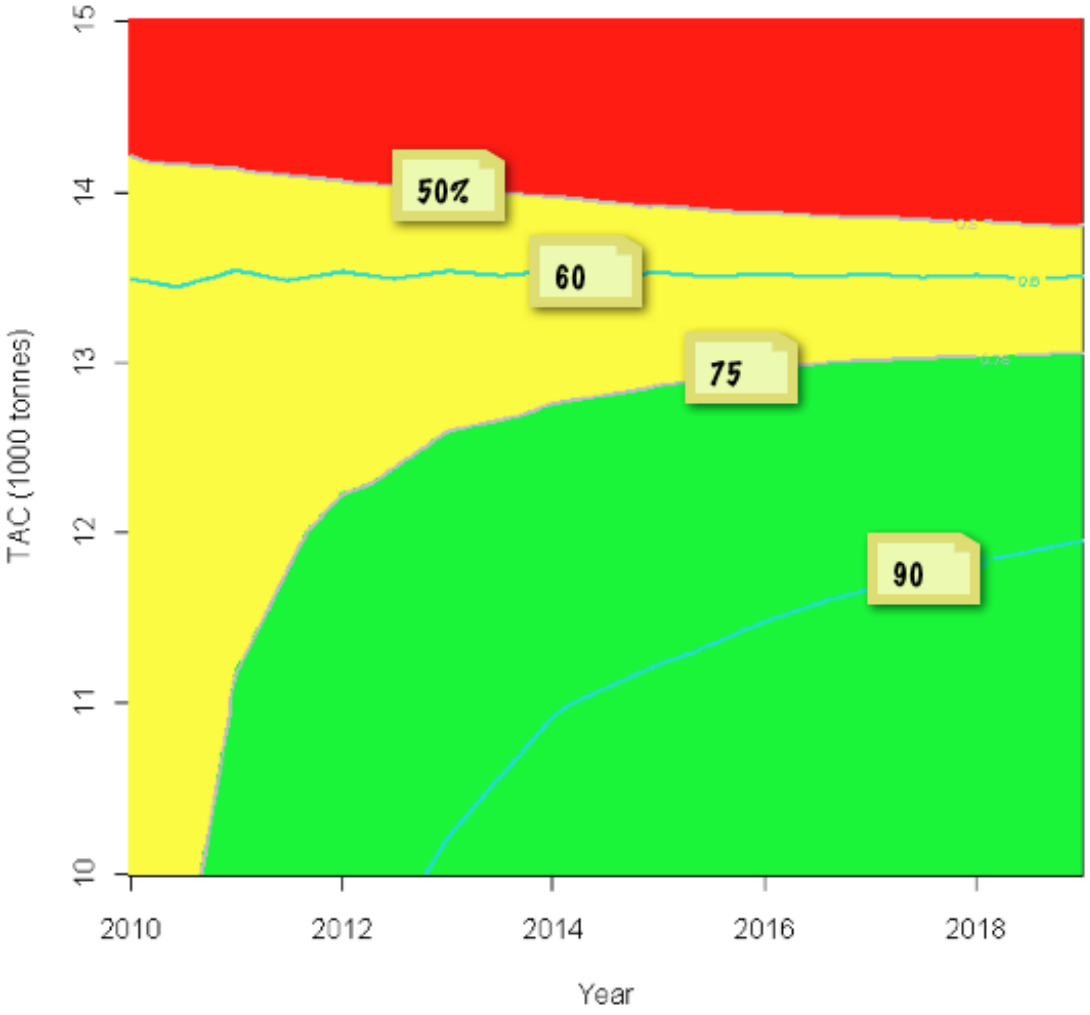


The results suggest that there is greater than 50% probability that the stock is at or above B_{MSY}, *and thus the Commission's rebuilding objective [99-2] has been achieved.*

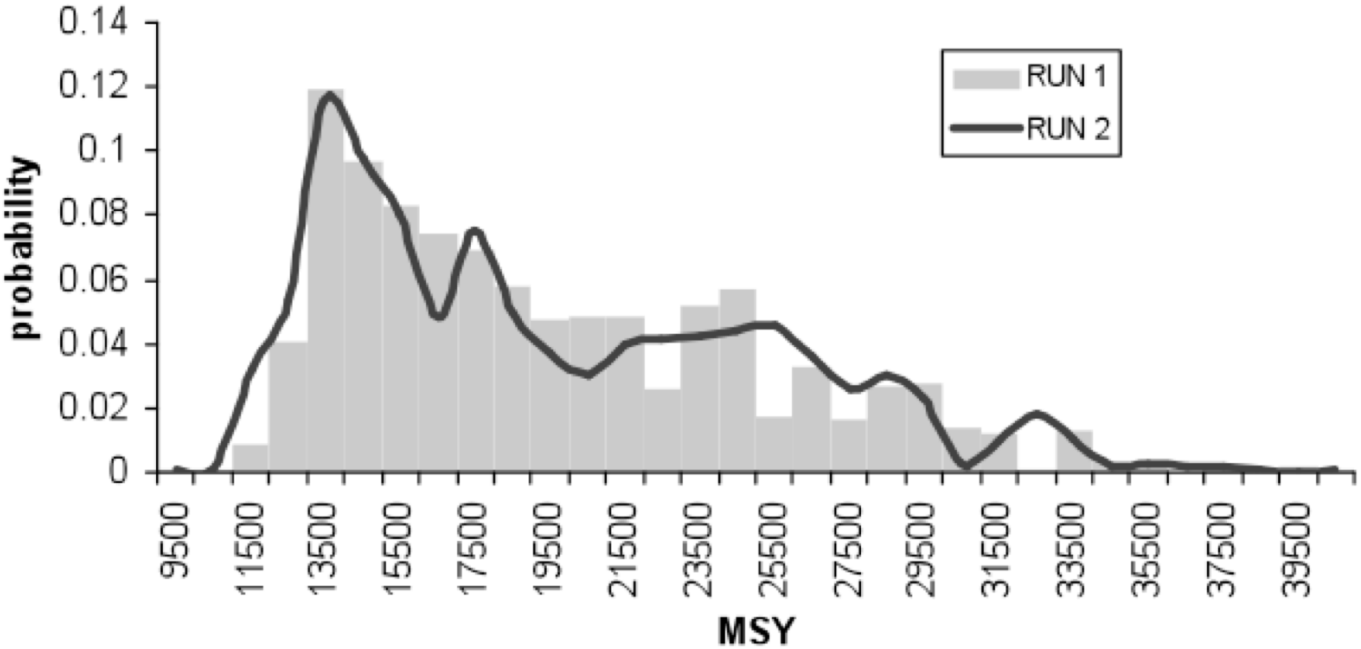
Probability of staying in the Rebuilt Zone given varying future catches, North Atlantic

- 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.

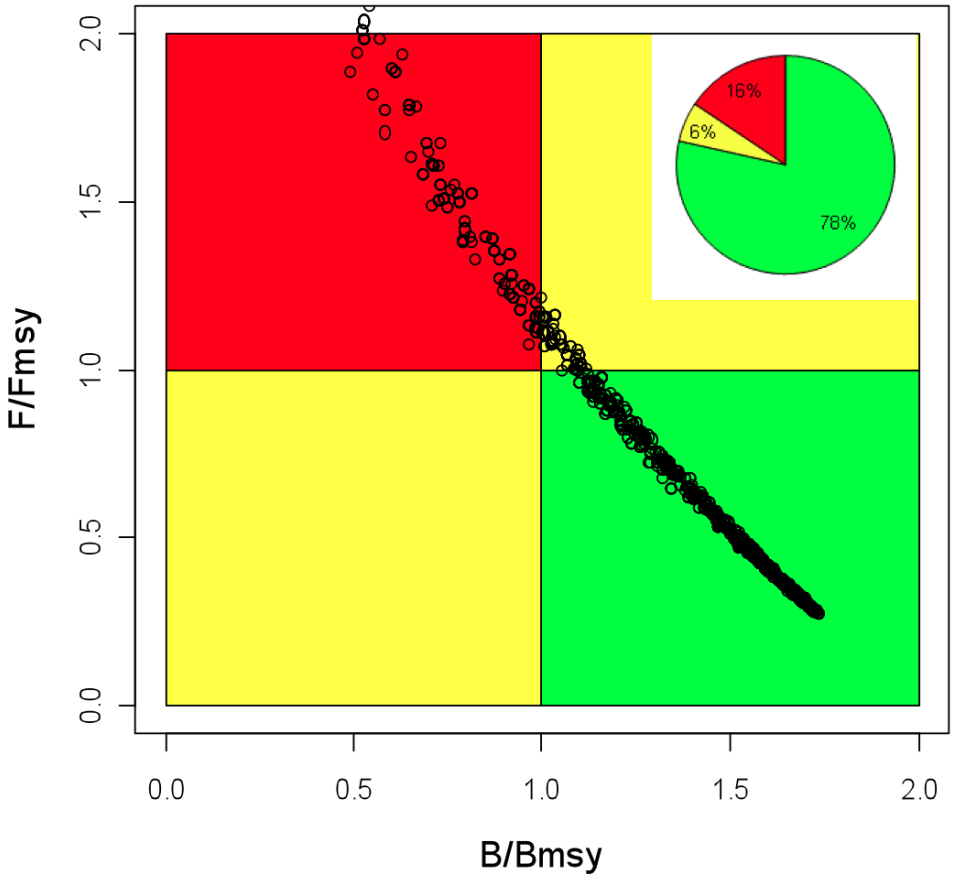


Catch only modeling results, South Atlantic



Because of the high level of uncertainty associated with the south Atlantic production models results, the Group conducted catch-only modeling analysis, including two explorations using different assumptions concerning the intrinsic rate of population increase. The distribution for MSY was skewed for both runs. The median of MSY estimated for both runs was about 18,000 t.

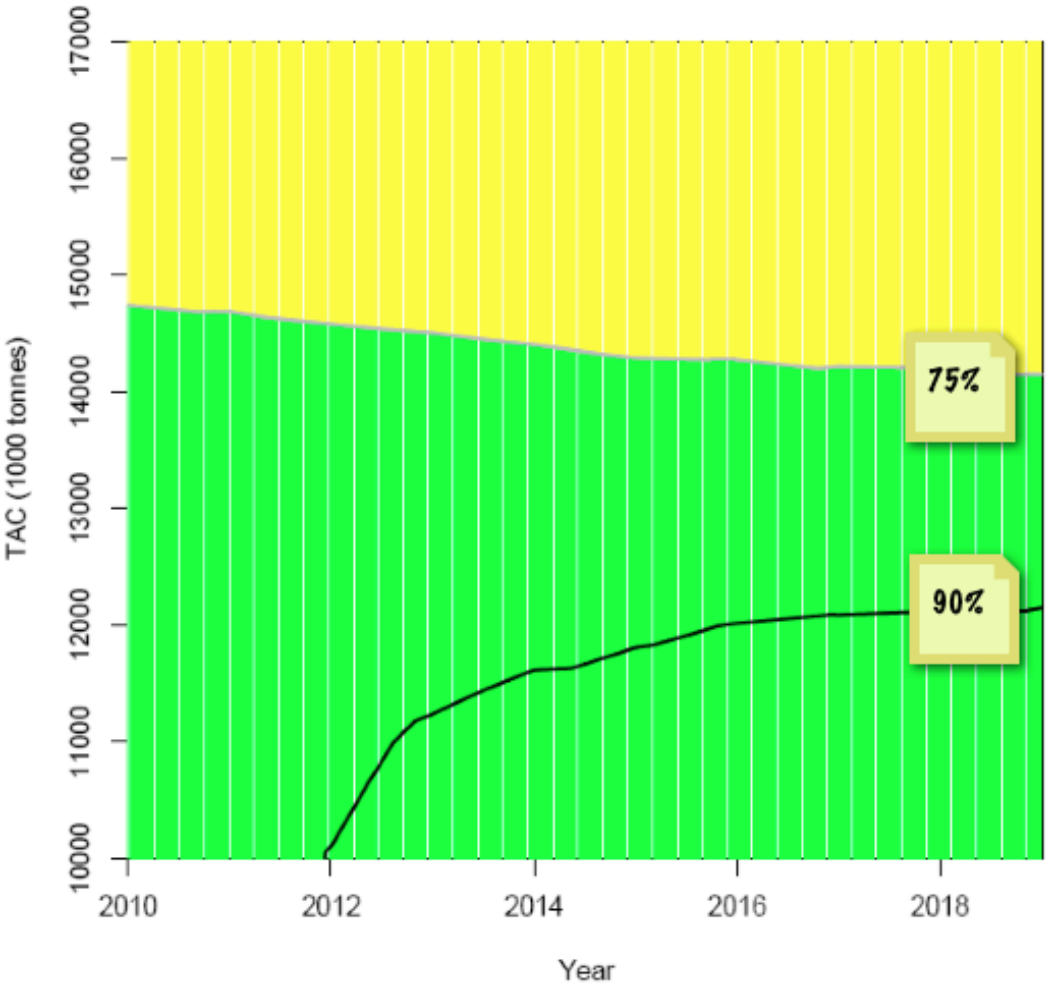
Stock Status, South.



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.*

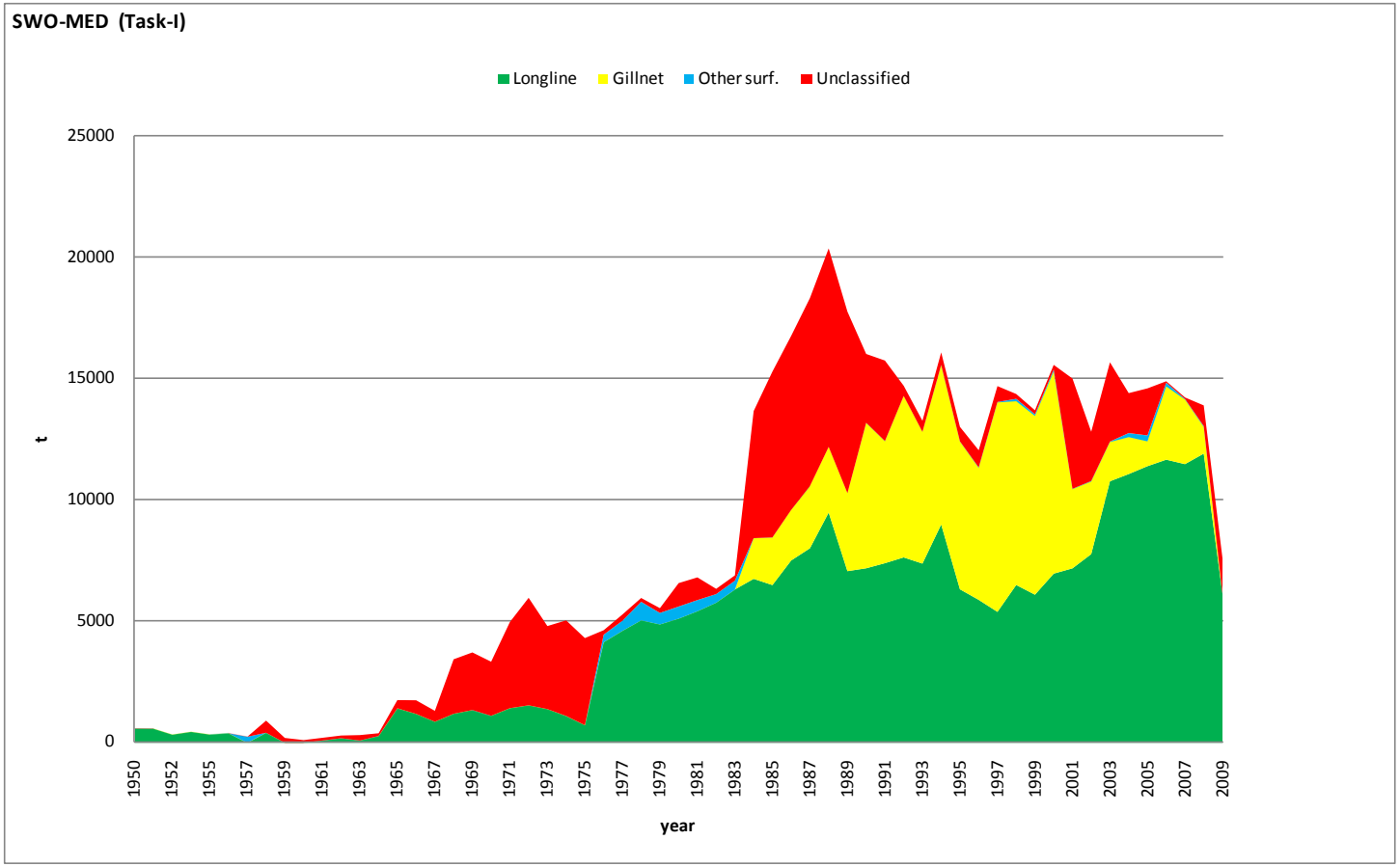
Probability of staying in the Rebuilt Zone given varying future catches, South Atlantic

- 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.

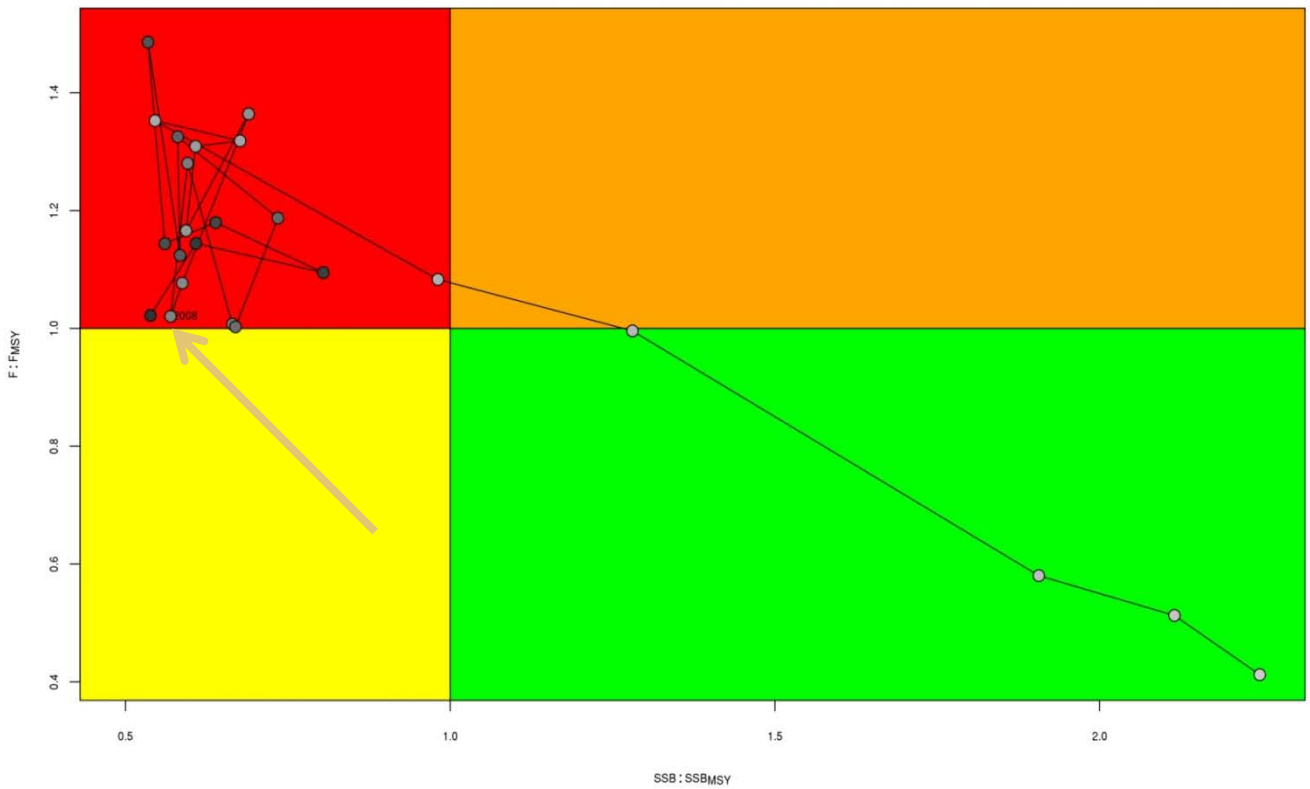


Mediterranean Swordfish Assessment 2010

- Main gears: Longlines & Gillnets
- Catches around 12000-16000 t in the last 15 years
- 11153 t (unofficial estimate 12164) for 2008, 2009 data incomplete



Stock status (2010 assessment)



Based on XSA results

Summary table

Maximum Sustainable Yield	14,600-16,700
Current (2008) Yield	11,153 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

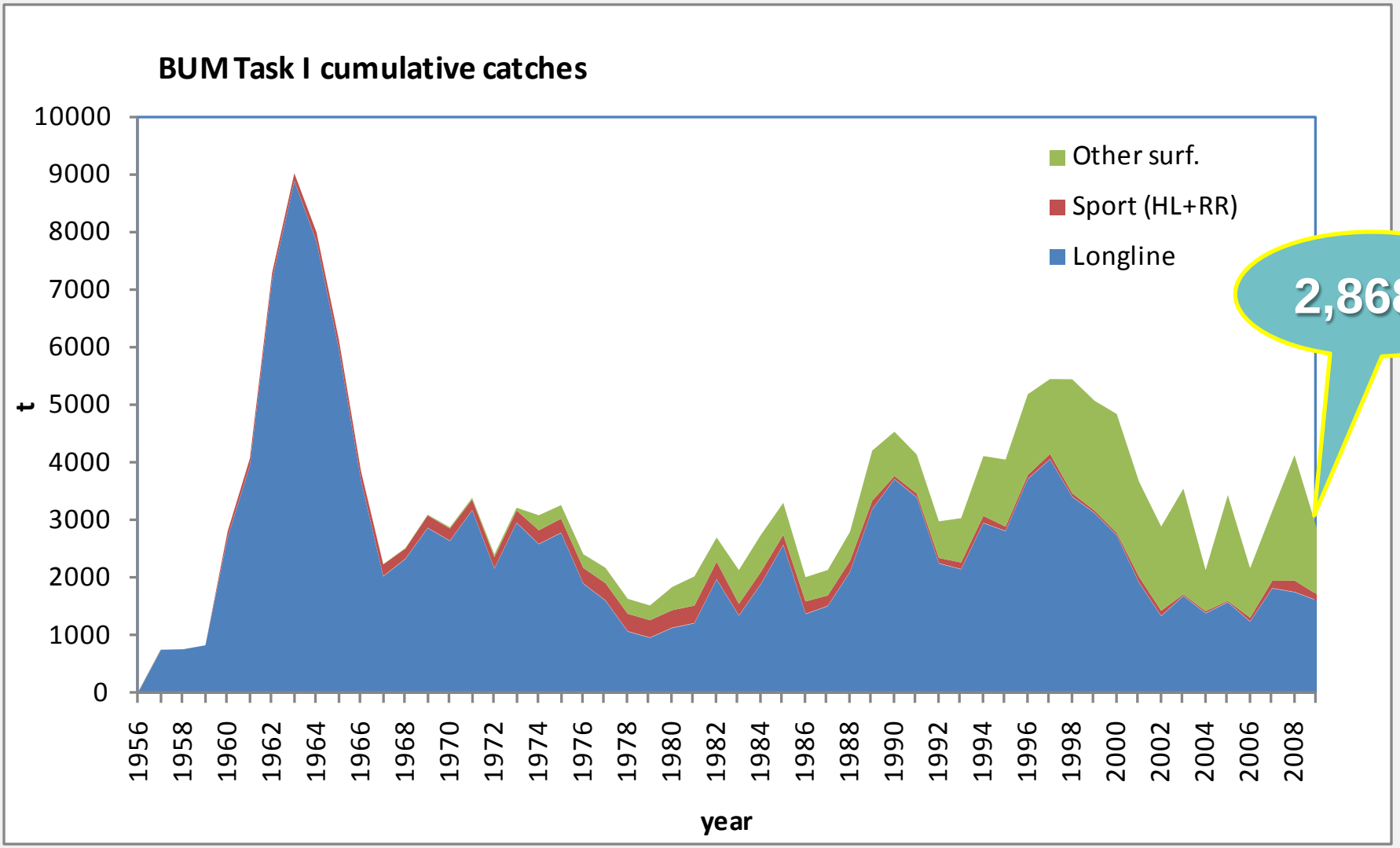
SCRS Shark Recommendations

- Due to the vulnerability and deficient statistical information on sharks, until this information is available, the Commission should adopt conservation measures that reduce fishing mortality. In species where there exists concern in terms of over-exploitation and there is expectancy of post-discard survival, it is recommended that retention be prohibited.
- Research programs to minimize by-catch and the discard mortality of sharks, particularly porbeagle, should be carried out by CPCs. The Commission should work with other RFMOs in order to achieve recovery of the stocks in the North Atlantic and prevent overexploitation in the South Atlantic.
- The Committee recommends continuing activities with the ICES Working Group on Sharks, participating in the porbeagle data preparatory meeting that ICES will hold in 2011, and in the future assessment to be carried out in 2012.
- Considering that the oceanic whitetip shark is found among the five species with the highest risk in a Ecological Risk Assessment carried out in 2008, the Committee recommends a precautionary approach and suggests establishing a minimum size of catch of 200 cm TL. It is suggested that research be carried out on the life history of this species aimed at adopting future Recommendations.
- The Committee recommends holding a data preparatory meeting in 2011 to generate the necessary information to conduct an Ecology Risk Assessment on sharks in 2012. The national scientists should meet and submit all the information available on the fishing operations and the life history of pelagic sharks.

NOAA
FISHERIES
SERVICE

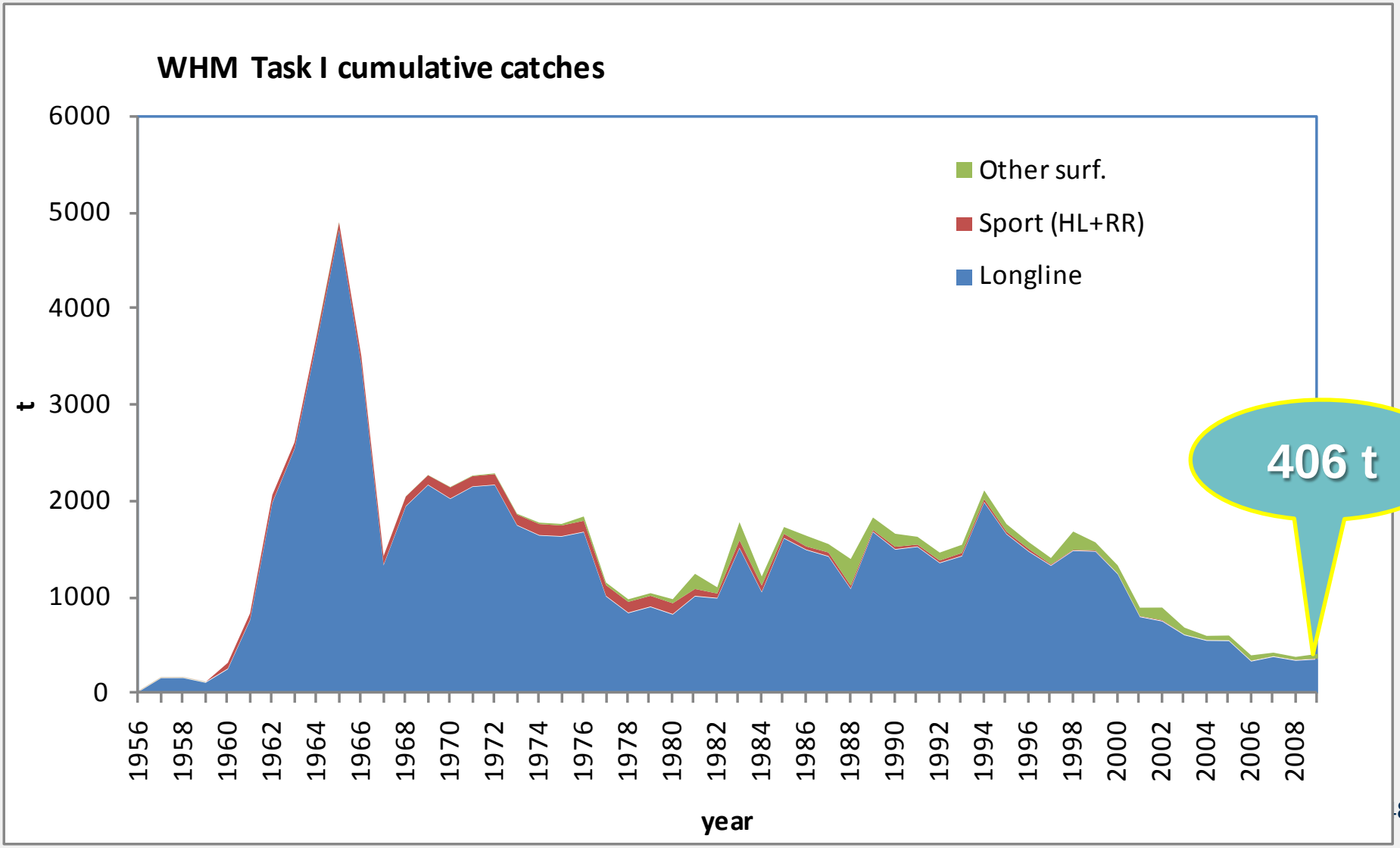
Billfish Working Group

Blue marlin


BUM Task I cumulative catches
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
t
Other surf.
Sport (HL+RR)
Longline
2,868 t
1956
1958
1960
1962
1964
1966
1968
1970
1972
1974
1976
1978
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
year

White marlin

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.



BUM / WHM. Summary table

	BUM	WHM
B_{2004}/B_{MSY}	< 1.0	< 1.0
Recent Abundance Trend (2001-2004)	Possibly stabilizing	Slightly upward
$F_{2004}>F_{replacement}$	Possibly	No
$F_{2004}>F_{MSY}$	1.0	Possibly > 1.0
$Catch_{recent}/Catch_{1996}$ Longline	0.52	0.47
$Catch_{2004}$	2,916 t	610 t
$Catch_{2009}$	2,868 t	406 t
Rebuilding to B_{MSY}	Potential to rebuild under current management plan but needs verification	
MSY	~ 2,000 t (1,000 ~ 2,400 t)	600-1,320 t

Objectives for 2010/2011

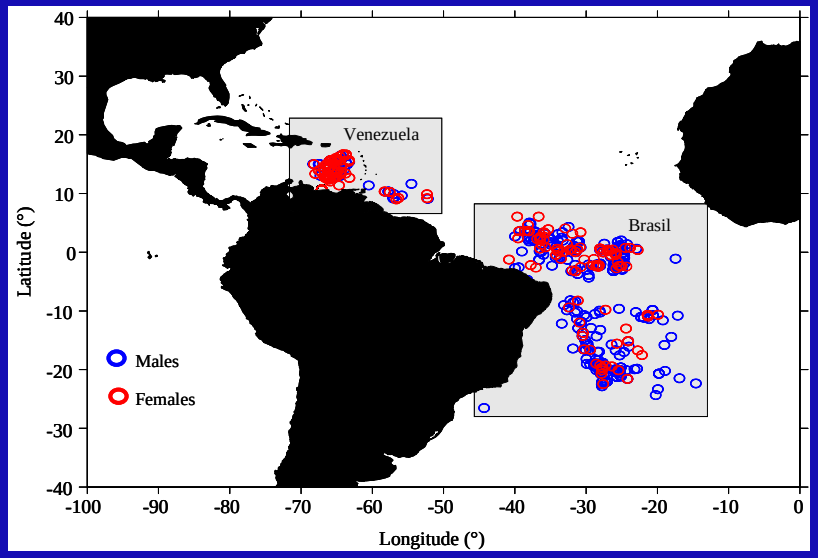
- **BUM Data preparatory meeting in 2010**
  - Update basic information (Task 1, 2, SZ)
  - Compile biological/habitat information
  - Review catches (especially from artisanal fleets)
  - Obtain new relative abundance estimates

- **BUM Assessment in 2011**
  - Estimate reference points for the stock
  - Update management recommendations

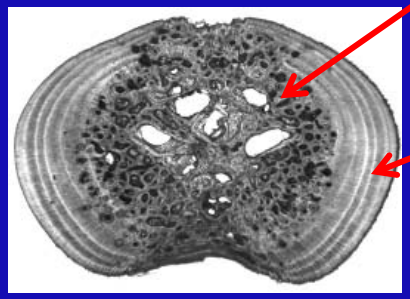
New Biological/Habitat information on BUM

Biology:

- A collaborative effort on the estimation of age structure and growth of Atlantic blue marlin led by Brazil has made progress towards estimating ages of over 500 fish utilizing sections of the 2nd anal fin ray.
- All samples originated from the Venezuelan and Brazilian tropical longline fisheries.
- It is expected that problems in identifiying yearling rings and false rings will be resolved in the near future, so robust growth estimates can be available for the BUM assessement in 2011.



Location of sampled specimens



Section of 2nd anal fin ray

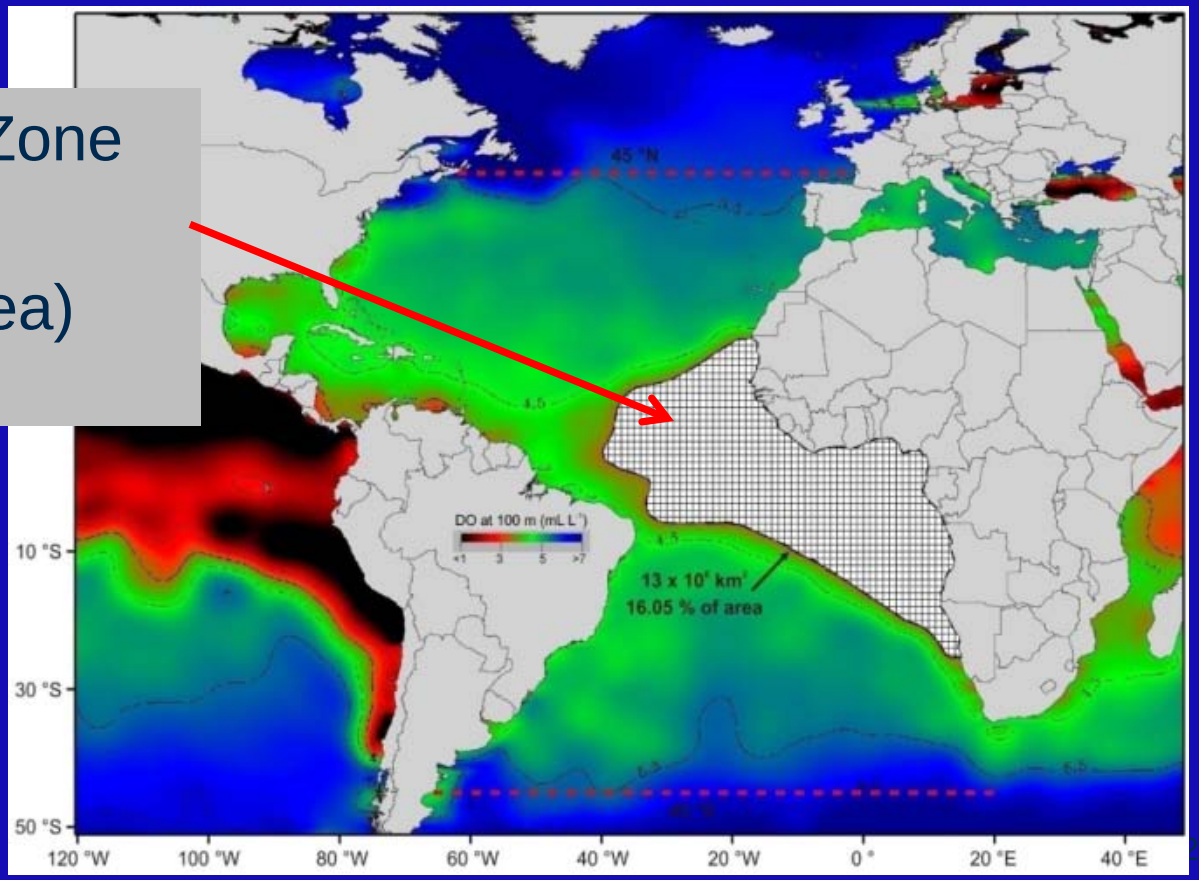
Habitat:

- A new study placing PSAT/ARCH tags on BUM describe vertical habitat use
- Showed impact of OMZ in the ETA on BUM habitat use
- BUM spent more time near surface in ETA than in WTA
- Increase vulnerability of BUM to surface gears in ETA
- Potential variability in catcability inside OMZ *vs* outside OMZ
- Catch rate standardization should consider this fact

Oxygen Minimum Zone (OMZ)

(Compression area)

from Prince *et al*., 2010



Inter-sessional plan in preparation for 2011 assessment

- Growth

  Provide growth estimates from spine sections

- Catch review

  Need analysis on gaps of reported catches form various CPCs

- Relative abundance indices

  Update indices for all major longline fleets, considering the geographical stratification proposed

  Complete work on indices from artisanal fleets

Conclusions

Significant improvement on biological/habitat knowledge, especially showing the impact of BUM habitat use in the ETA

Need to produce growth estimates

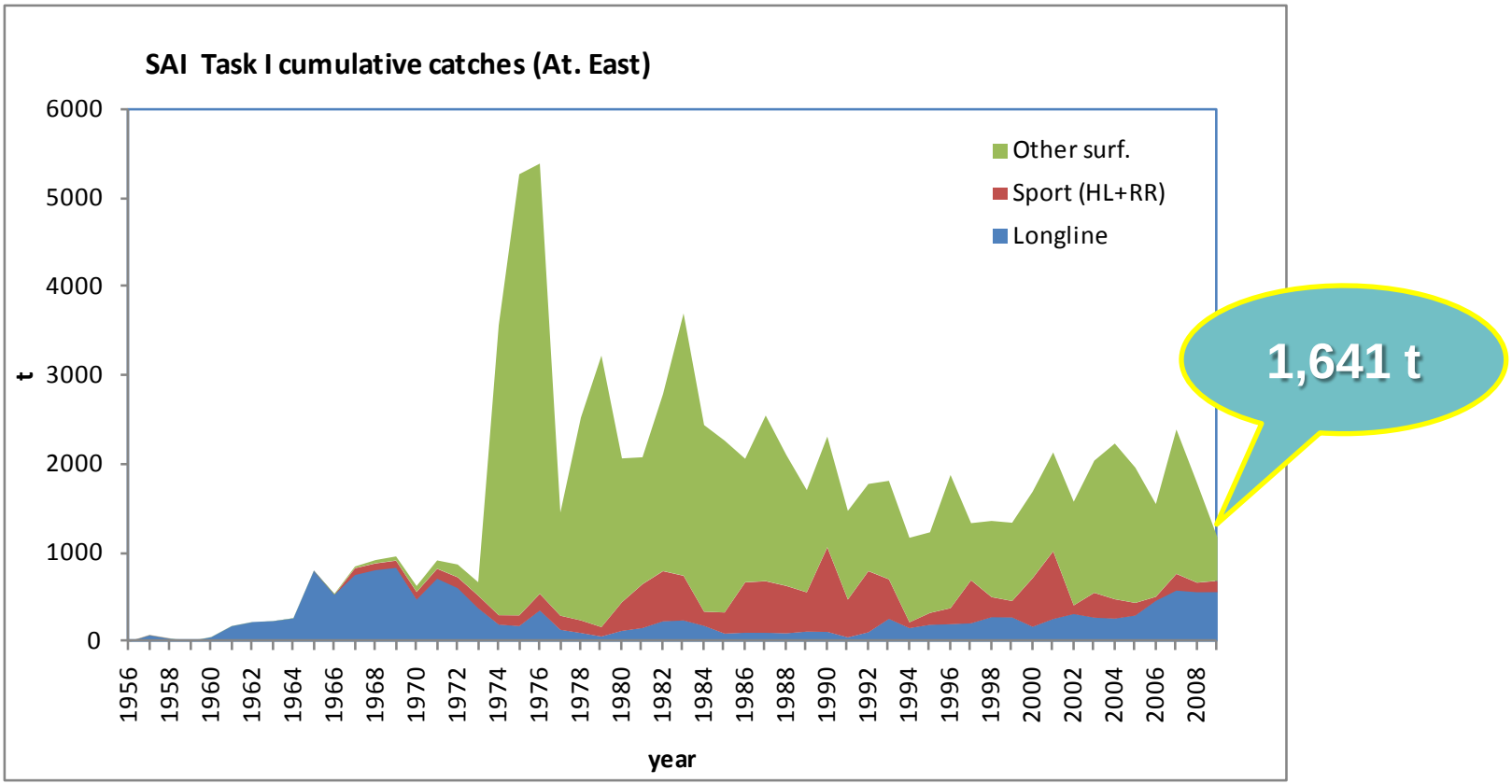
Noticeable improvement in catch statistics

Significant improvements in relative abundance indices

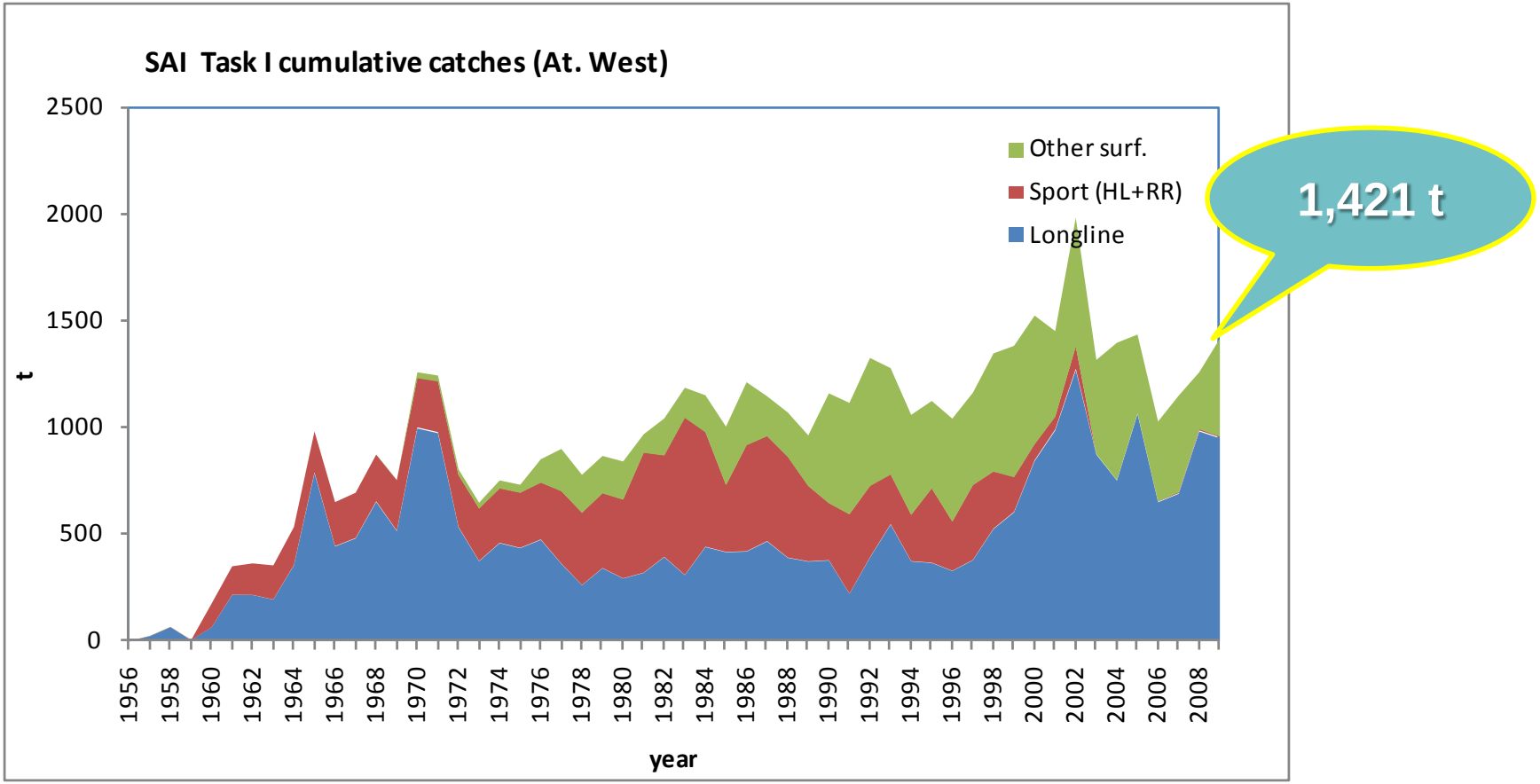
- -New abundance indices obtained for major fleets
- -Need updates for all longline abundance indices considering the OMZ

Proceed with assessment in 2011

SAI. Fishery indicators
SAI East stock



SAI west stock



SAI. Summary table

	SAI WEST	SAI EAST
MSY	600-1,100 t	1,250-1,950 t
Recent Yield (2007)	1,188 t	2,281 t
B_{2006}/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
Catch $_{2009}$	1,421 t	1,641 t
Management measures in Effect	None	None

ICCAT MEETINGS 2011

	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat
Jan		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31					
Feb					1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28					
											R tools Whorkshop							GBYP A.S./Tag.conv./Bio. Samp.																		
Mar					1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31		
						WG Org.																			Methods WG												
Apr	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30							
																									BUM ass./WHM data												
May			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31				
						cir. hooks Miam					SC-ECO Miami														Trap S. Moroc.												
Jun						1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30		
						TROP WG ph. I																										BFT WG/Elect. Tag					
Jul	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31						
											TRFMOs 3 meeting														SHK data prep												
Aug				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31			
Sep							1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
											ALB SA/MED Assess																					Species Groups					
Oct		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31					
				SCRS																																	
Nov					1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30			
Dec							1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31

Possible ICCAT Holid

Scientific meeting