

Science, Service, Stewardship



Presentation of SCRS Meeting Results and Advice

IAC, October 2012

**NOAA
FISHERIES
SERVICE**

NOAA

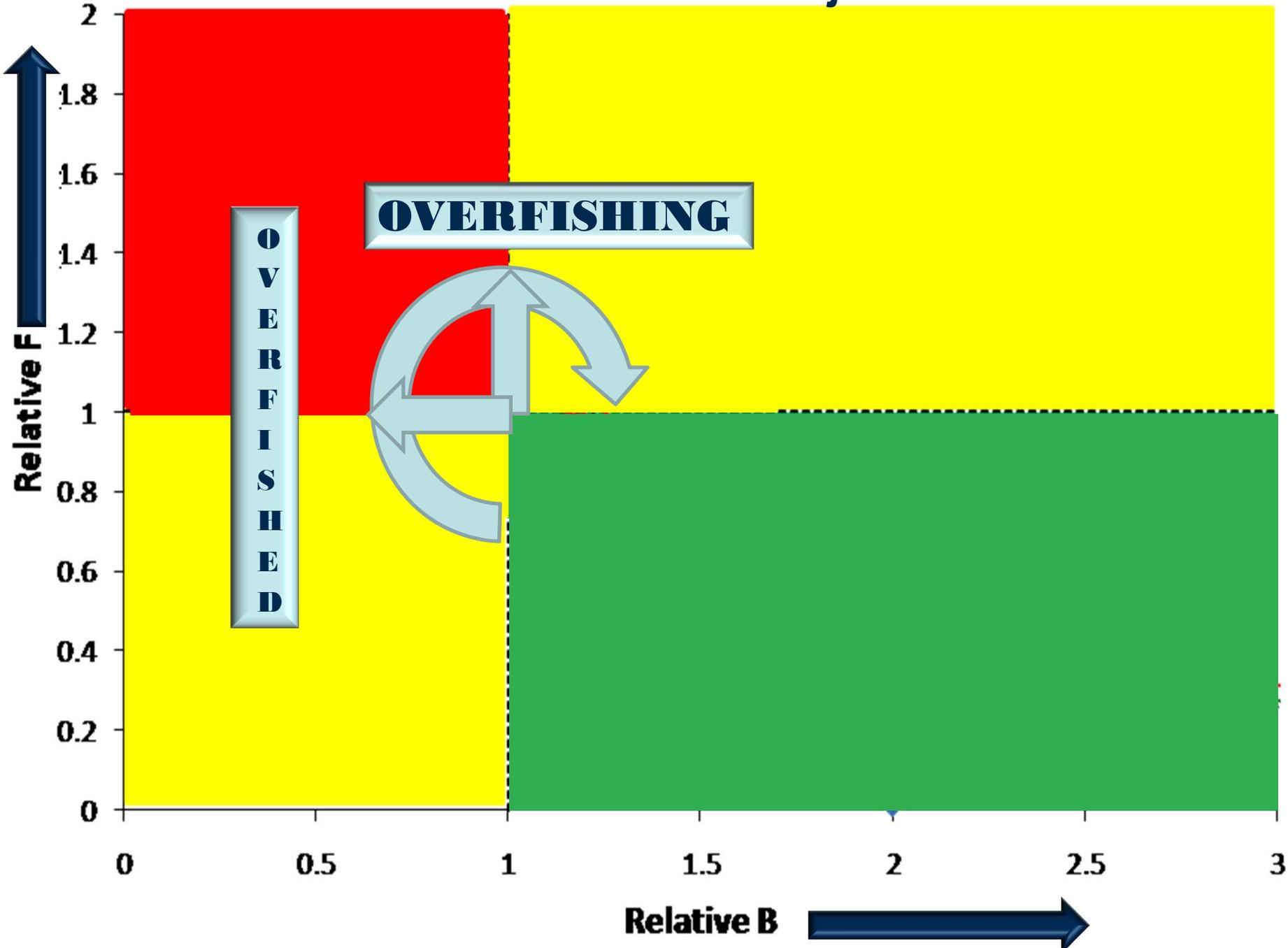
NOAA
FISHERIES
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Bigeye, Albacore, Yellowfin and Skipjack (BAYS) Tunas Working Group

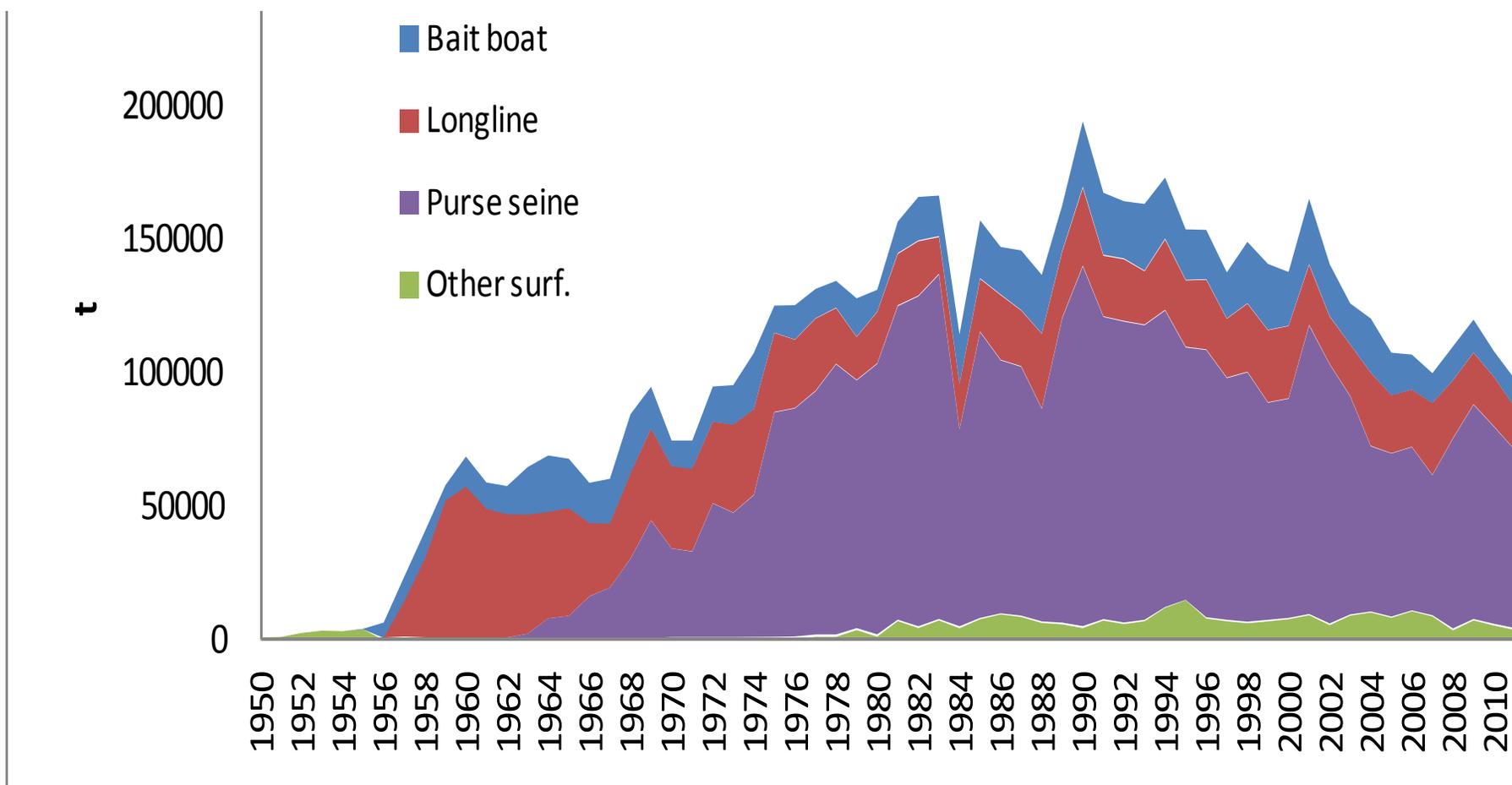


Stock Status Trajectories YFT

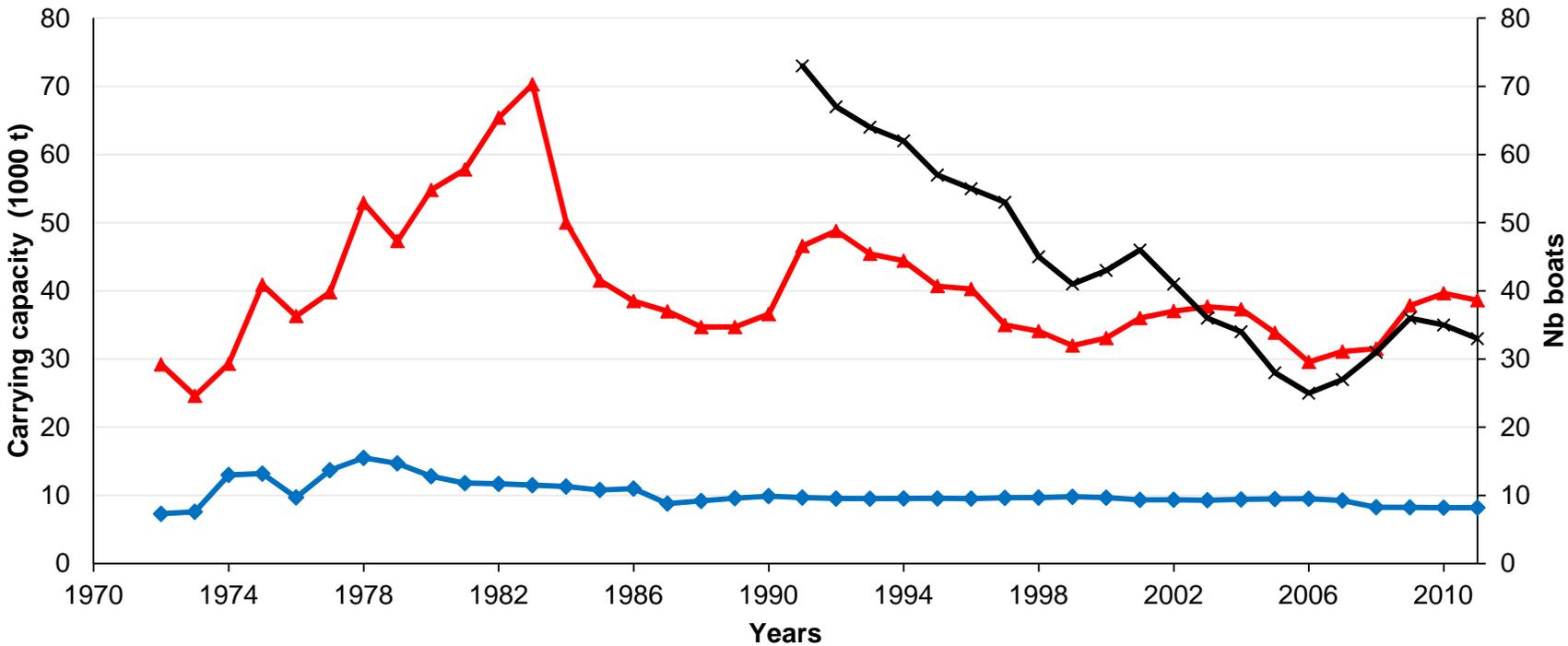


Rec. 11-01: The annual TAC for 2012 and subsequent years of the Multi-annual program is 110,000 t for yellowfin tuna and shall remain in place until changed based on scientific advice. If the total catch in any year exceeds the TAC for yellowfin tuna, the Commission shall review the relevant conservation and management measures in place.

The reported catches for 2011 are 100,227 t. However, the actual 2011 catches may be higher, as reports have not yet been received for some fleets. If these fleets realized catches at similar levels to those of 2010, total catch for 2011 might be around 105,000 t



East Atlantic

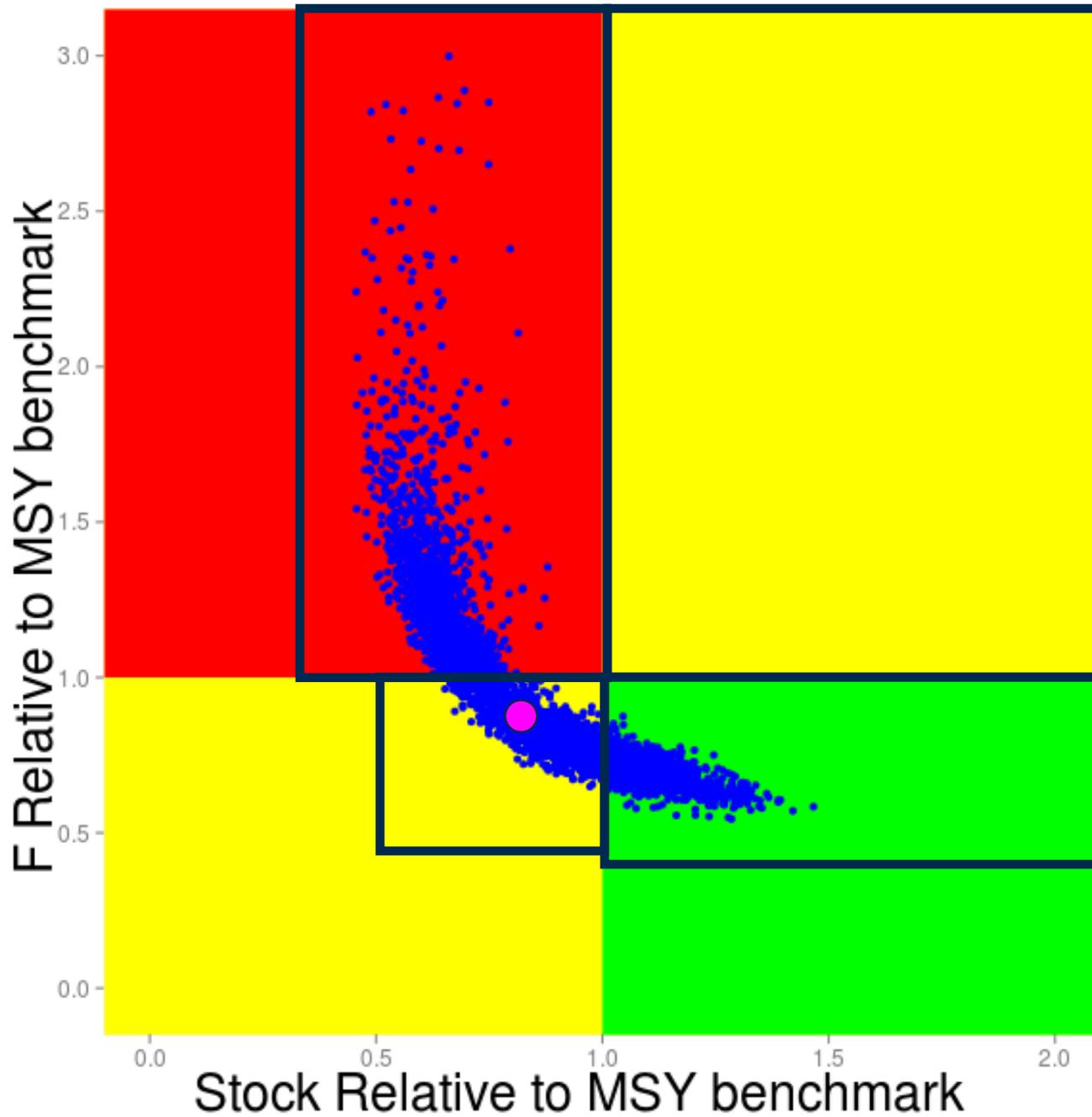


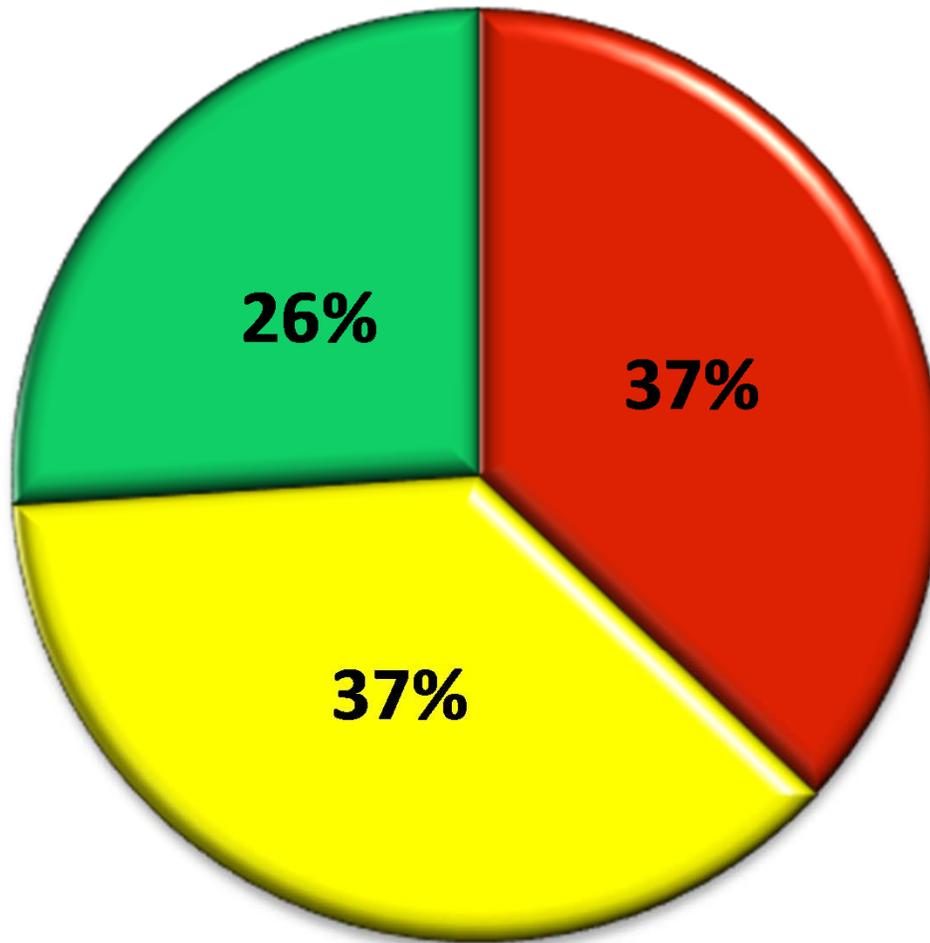
◆ TOTAL BB

▲ TOTAL PS

× Nb EU and associated PS

Current Stock Status

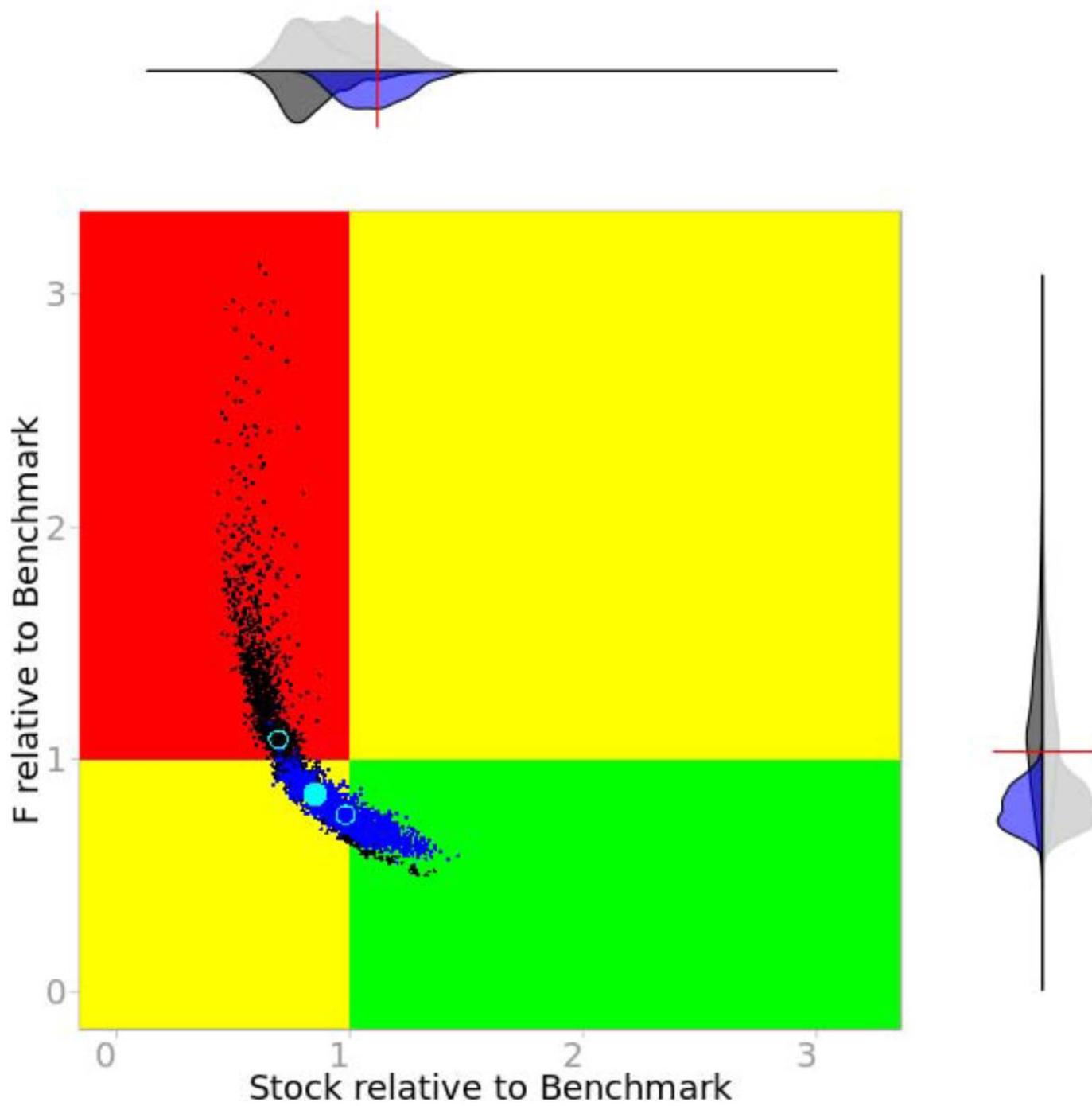




■ overfished and overfishing

■ overfished

■ neither overfished nor overfishing



ATLANTIC YELLOWFIN TUNA SUMMARY

Maximum Sustainable Yield (MSY)	144,600 ¹ (114,200 - 155,100)
2011 Yield ²	100,277 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:

[Rec. 93-04]:

- Effective fishing effort not to exceed 1992 level

[Rec. 11-01] (in effect beginning in 2012):

- Time-area closure for FAD associated surface fishing; TAC of 110,000 t beginning in 2012
- Specific limits of number of longline and/or purse seine boats for a number of fleets

Other measures also impacting yellowfin tuna

[Rec. 09-01], para. 1 of [Rec. 06-01], [Rec. 04-01]:

- Limits on numbers of fishing vessels less than the average of 1991 and 1992.
- Specific limits of number of longline boats; China (45), Chinese Taipei (75), Philippines (10), Korea (16).
- Specific limits of number of purse seine boats; Panama (3).
- No purse seine and baitboat fishing during November in the area encompassed by 0°-5°N and 10° W-20°W.

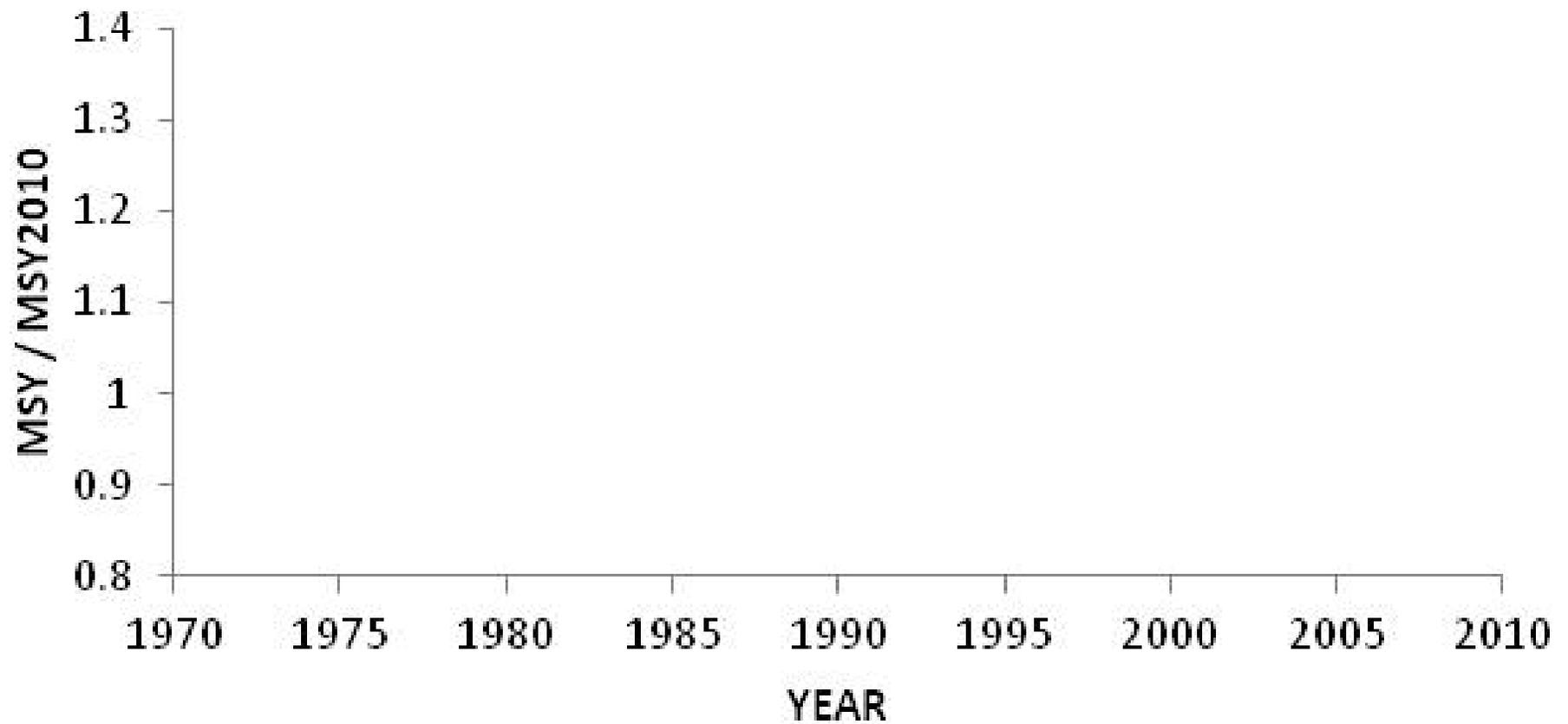
NOTE: $F_{current(2010)}$ refers to F_{2010} in the case of ASPIC, and the geometric mean of F across 2007-2010 in the case of VPA. As a result of the constant trend in recruitment estimated by the VPA model, F_{MAX} is used as a proxy for F_{MSY} for VPA results. Relative biomass is calculated in terms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

² Reported as of the SCRS Plenary session. The actual 2011 catches may be substantially higher, as reports have not yet been received for some fleets. If these fleets realized catches at similar levels to those of 2010, total catch for 2011 might be around 105,000 t

³Median (10th-90th percentiles) from joint distribution of age-structured and production model bootstrap outcomes considered.

MSY Relative to MSY 2010





Best estimates of status of BET suggest the stock and fishery are close to the convention's objectives

ATLANTIC BIGEYE TUNA SUMMARY

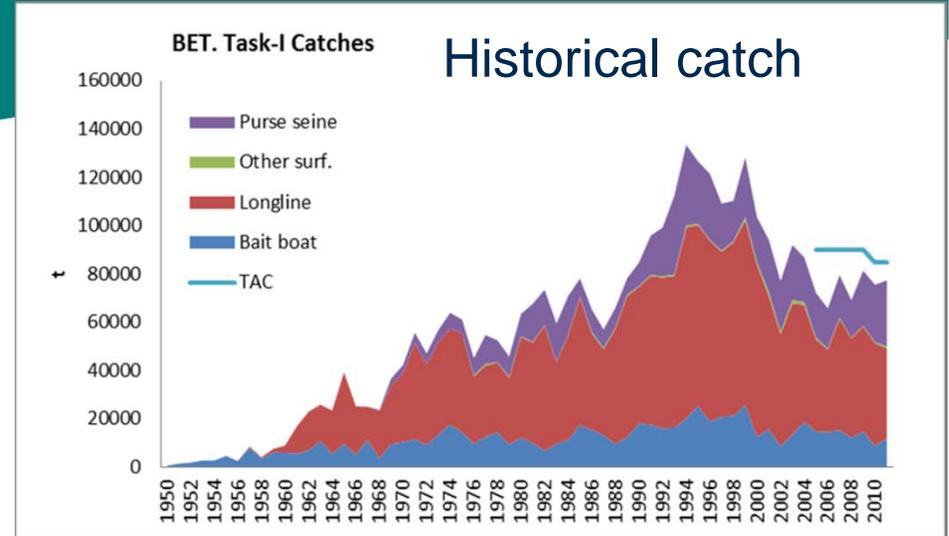
Maximum Sustainable Yield	78,700-101,600 t (median 92,000 t) ^{1,2}
Current (2011) Yield ¹	77,795 t ^{2,3}
Replacement Yield (2011)	64,900 – 94,000 (median 86,000 t) ^{1,2}
Relative Biomass (B_{2009}/B_{MSY})	0.72-1.34 (median 1.01) ^{1,2}
Relative Fishing Mortality F_{2009}/F_{MSY}	0.65-1.55 (median 0.95) ^{1,2}



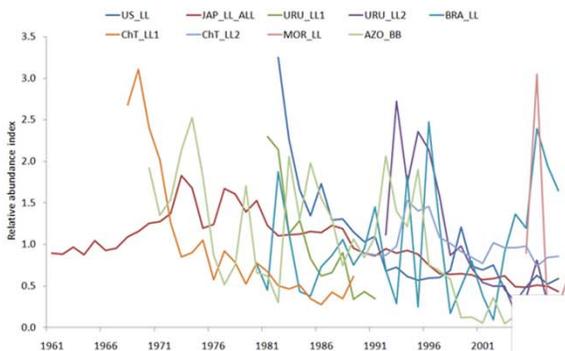
Continue to have large uncertainties in the result of the assessment

ATLANTIC BIGEYE TUNA SUMMARY

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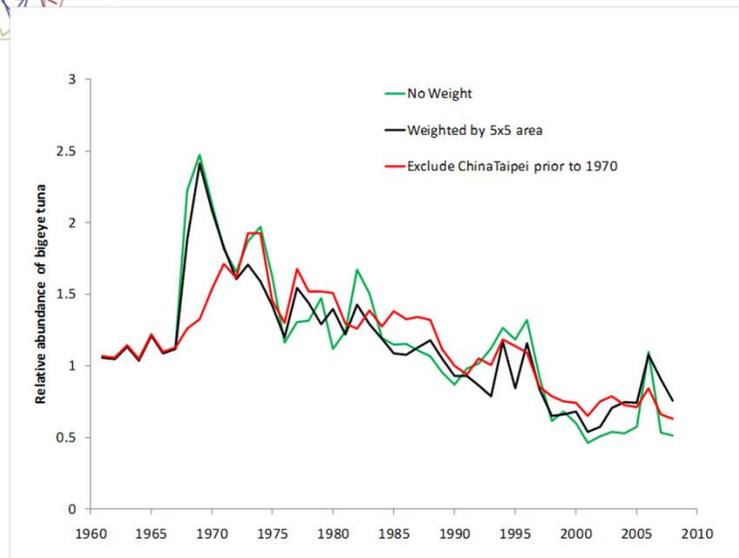
Relative abundance indices



6 from longline fleets
and 1 from Baitboat fleet

2011 (preliminary) catch 77,513 t

3 different
combined indices

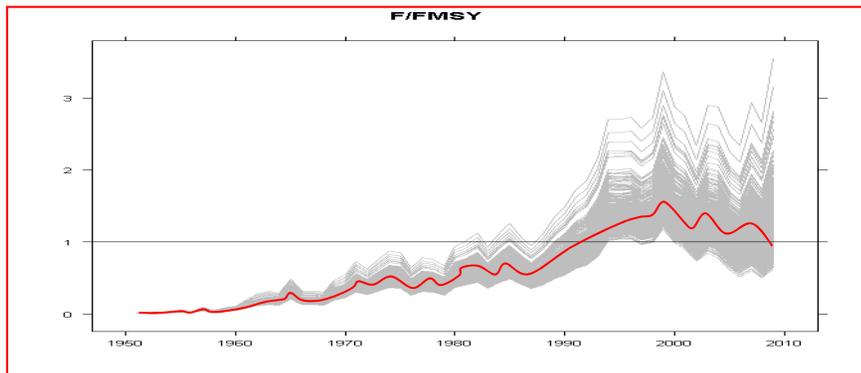


**MAIN sources
of data
for assessment**

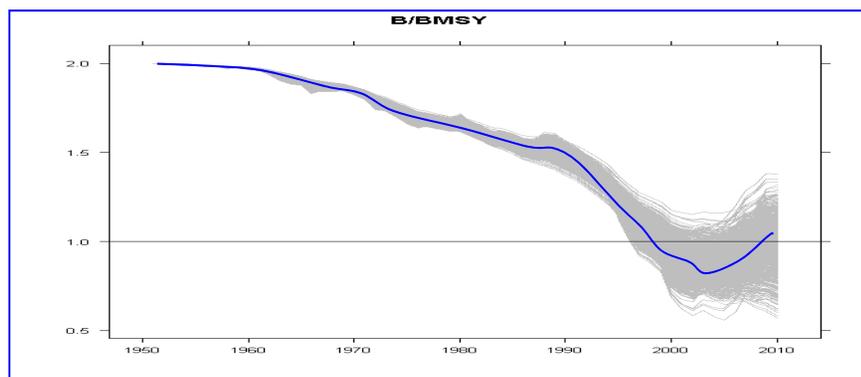


Characterization of uncertainty in the assessment of stock status for bigeye tuna

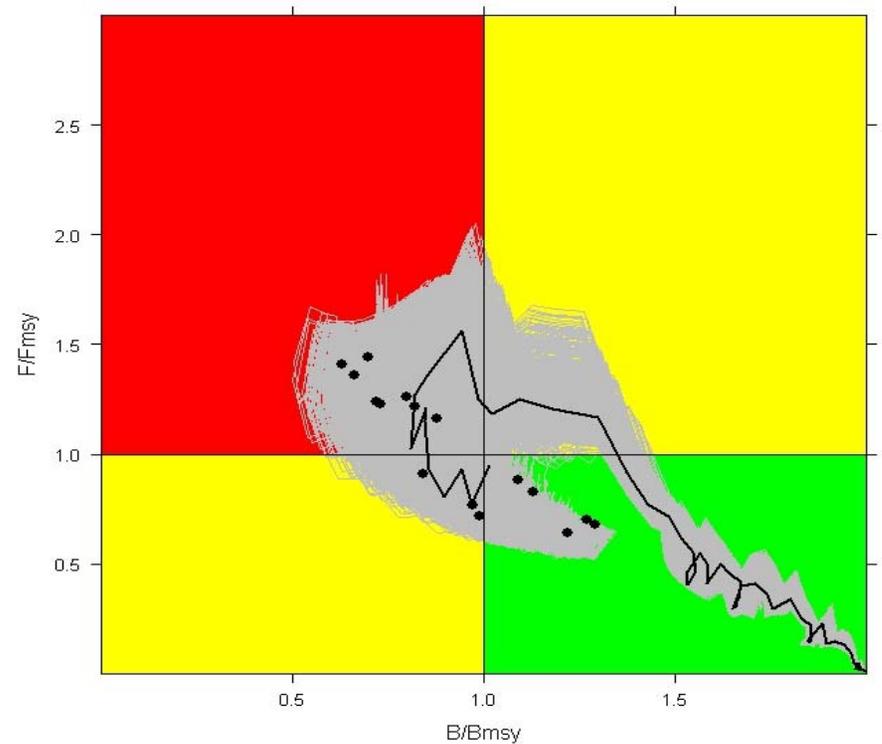
Observation uncertainty



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



Model uncertainty



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



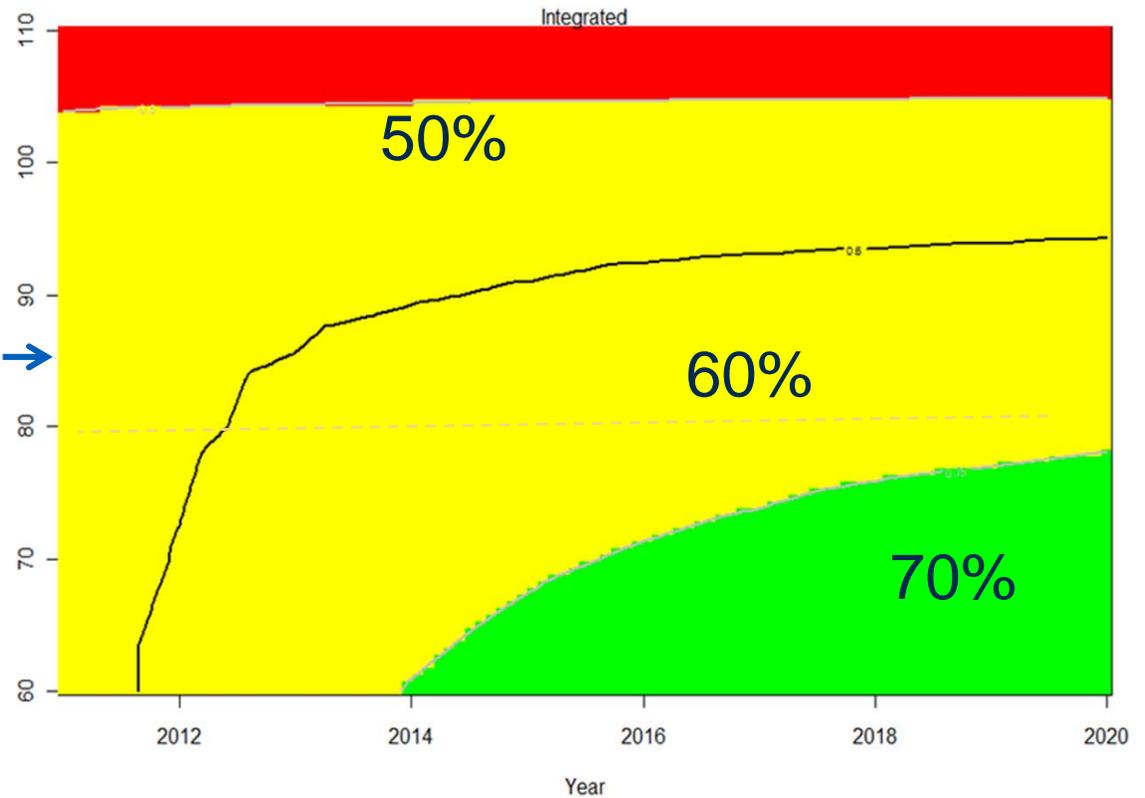
KOBE plot matrix

Current TAC 85,000 t

Reported catch 2011
77,513 t

TAC

Probabilities of the stock being above B_{MSY} and fishing mortality 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

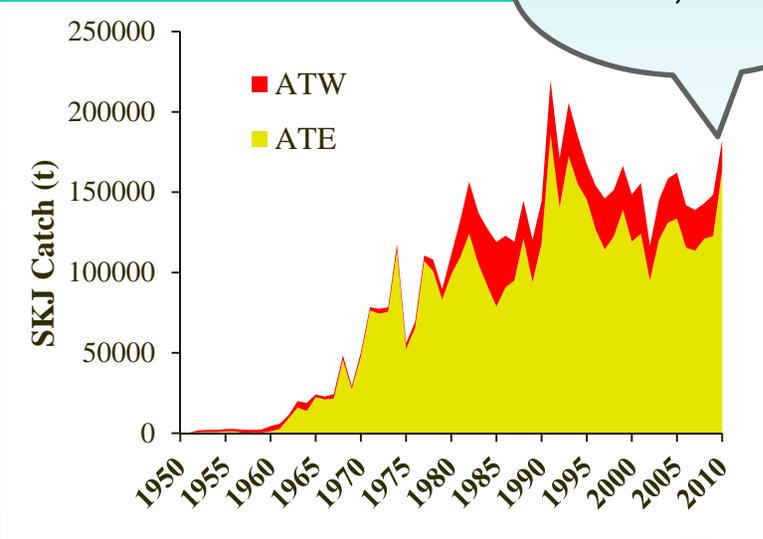
- Significant uncertainties remain in the assessment, partially because of data limitations
- Catches in 2010-2011 were below TAC and close to replacement yield calculated for 2010
- Fishing mortality in 2009 was close to F_{msy} and Biomass in 2009 was close to B_{msy}
- Outlook “*cautiously optimistic*” because of the amount of *uncertainty in the assessment*. If catches are maintained about current levels the stock should remain at levels that are consistent with the objectives of the Commission.



Atlantic-wide



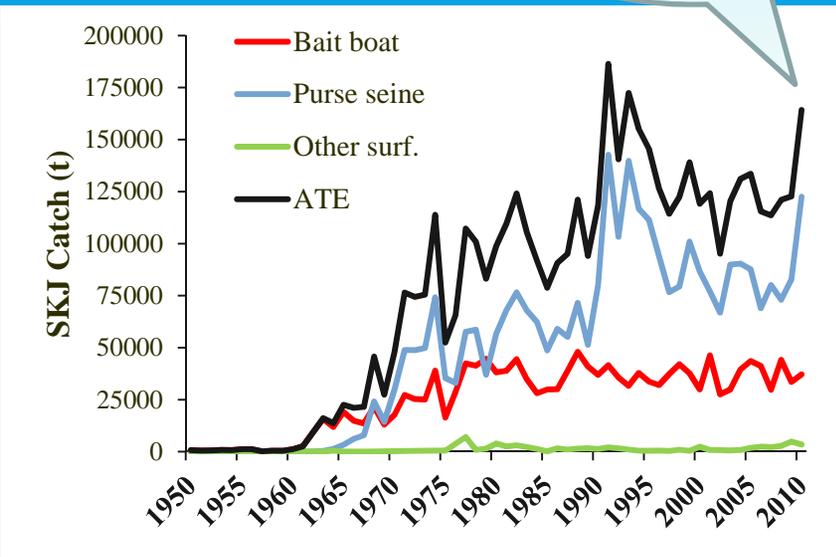
213,000 t



- There was a decline in skipjack 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

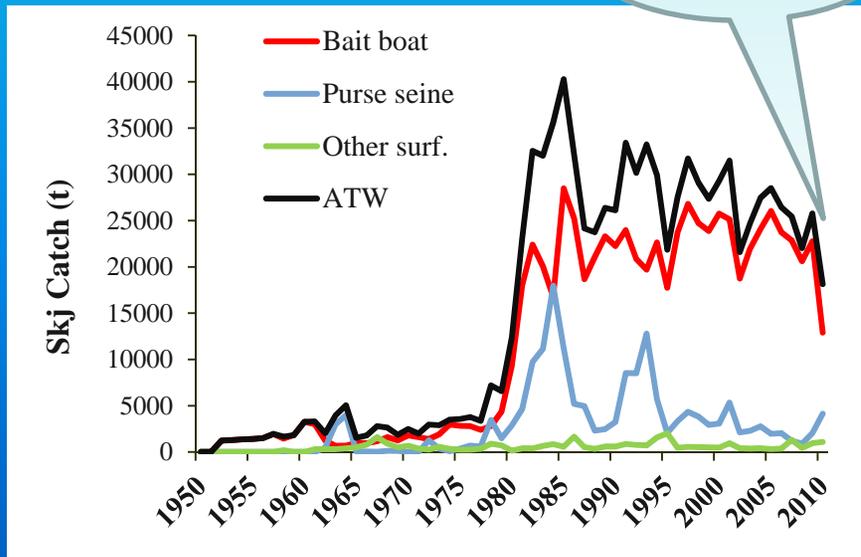
East

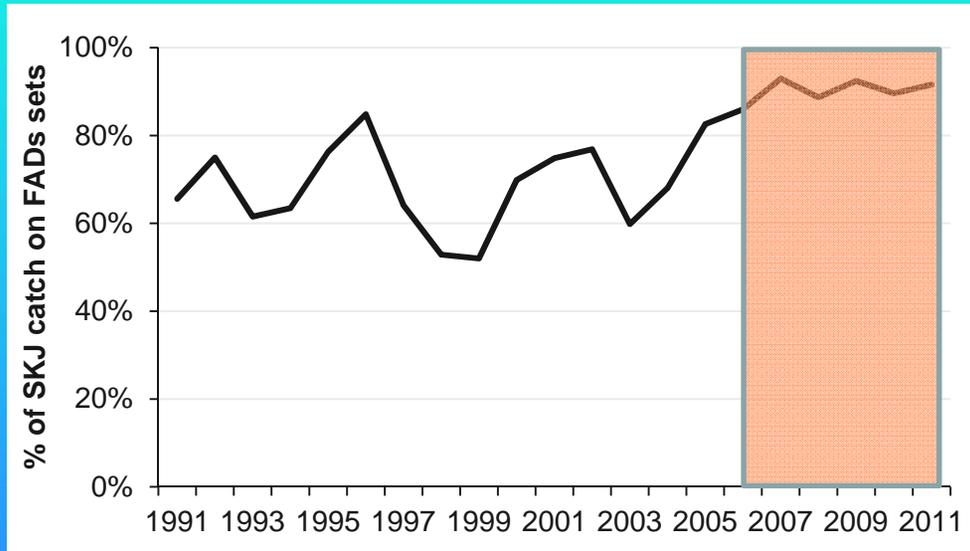
173,000 t



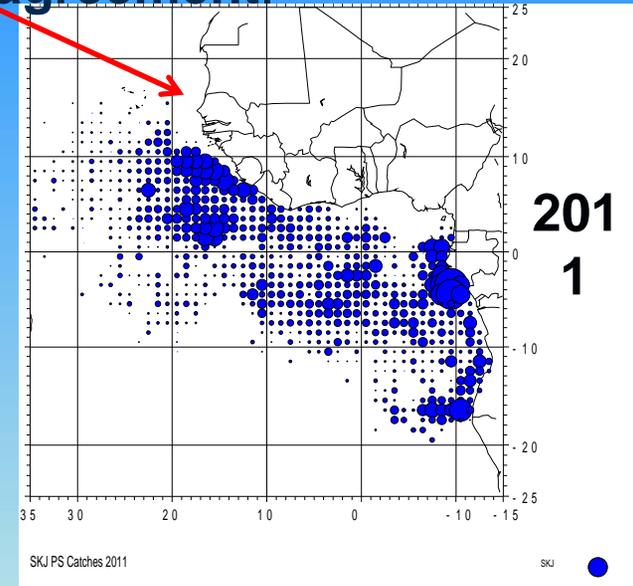
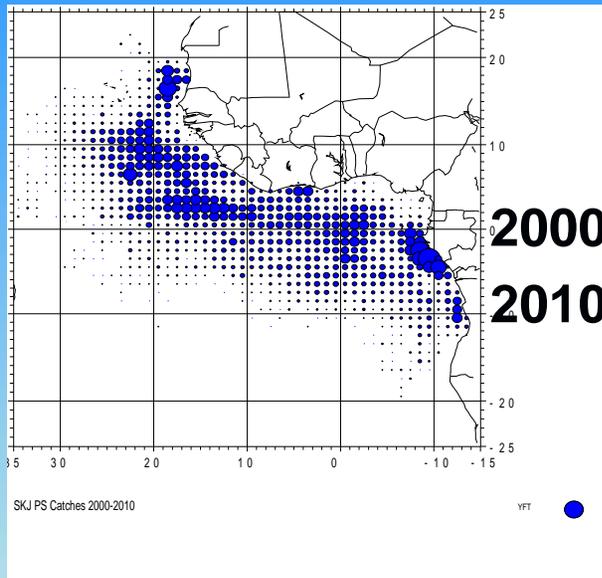
West

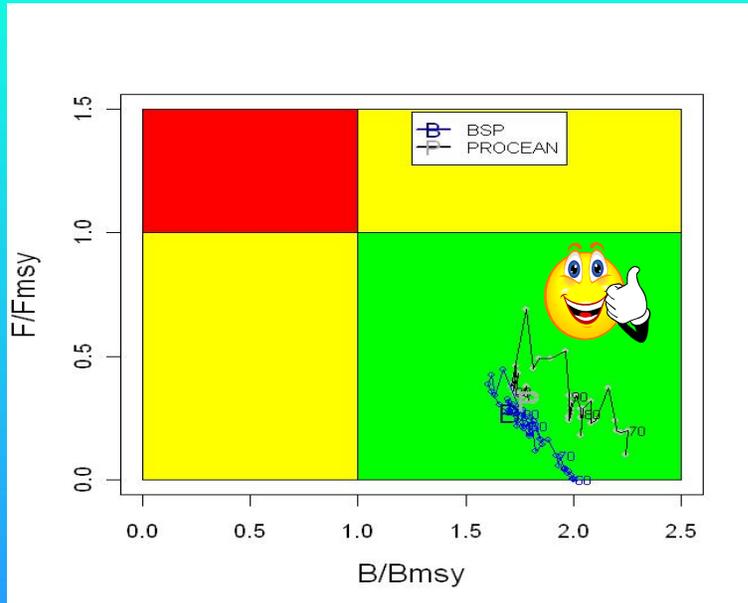
39,000 t





Since 2006 about 90% of SKJ catch are done on FADs but may be as a consequence of the withdrawal of the seasonal fishing on free school from the Senegal zone due to non-renewal of the fishing agreement.





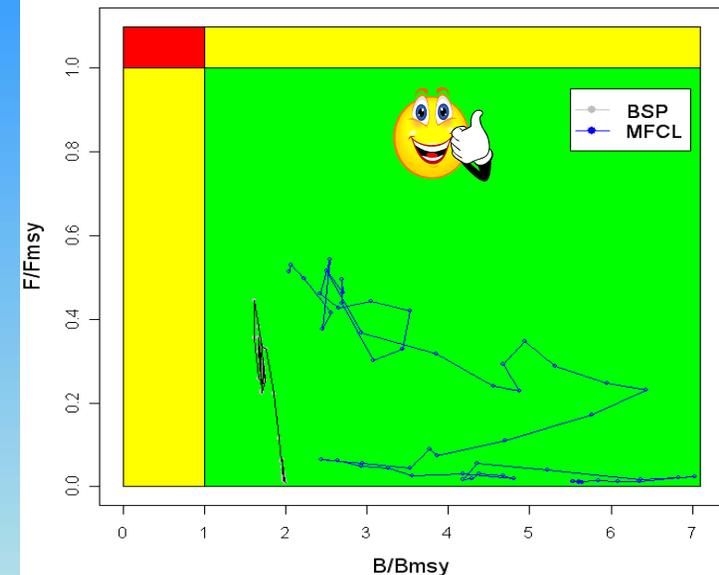
State of the Eastern Atlantic SKJ (conducted in 2008 with fisheries information until 2006)

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 (2011)	173,338 t
Average recent catches (5 years)	129,000 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 (2011)	39,300 t
Average recent catches (5 years)	~25,000 t



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



Tropical Tunas Work Plan for 2013

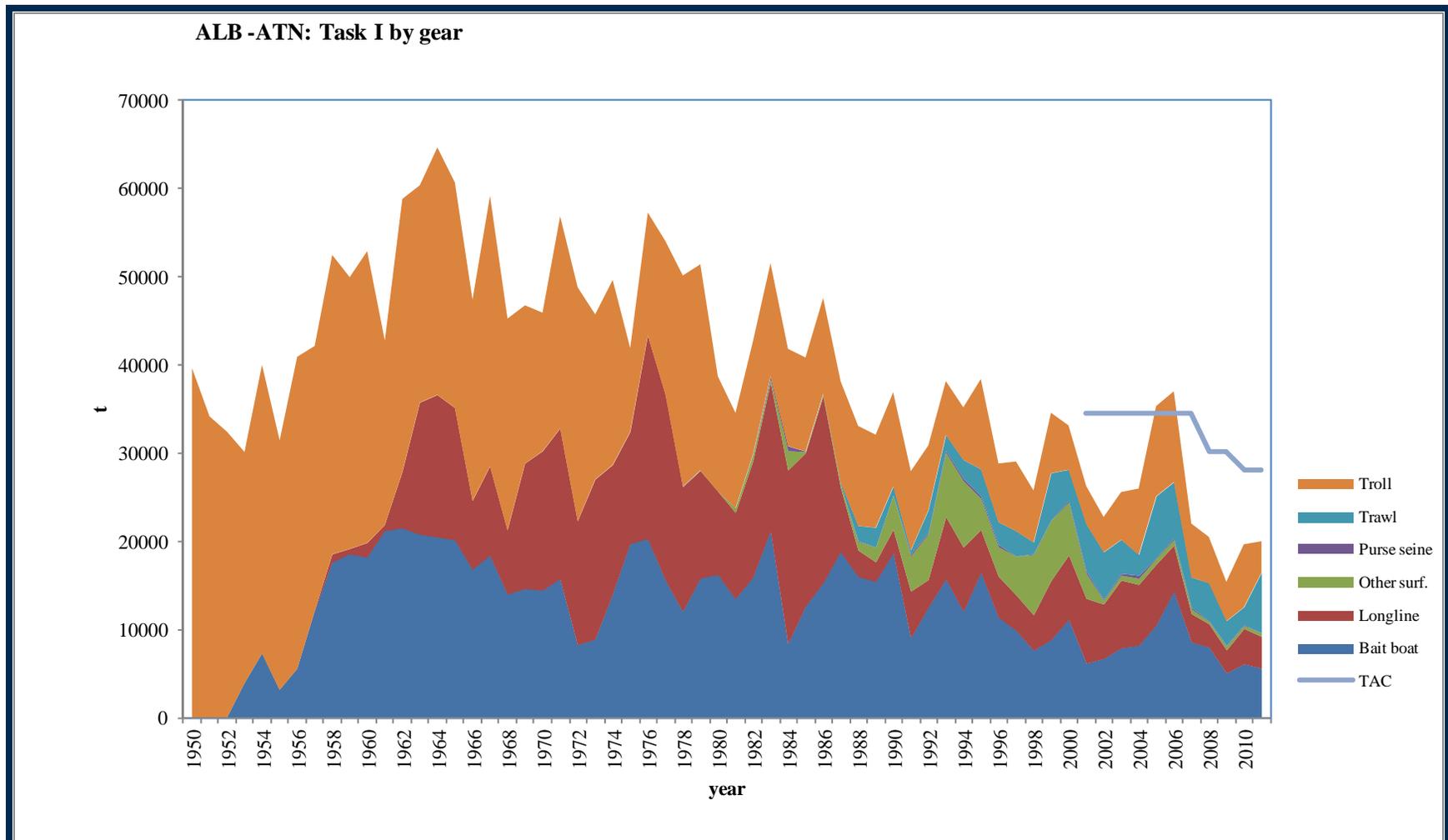
- **Update and develop the plan for a 5 year Atlantic-wide tagging program document to reflect current tagging objectives, the priorities and the budget.**
 - **The Committee expressed appreciation for the voluntary contribution provided by the United States (\$62,500); these funds are intended to support the development of the detailed scientific design for the program necessary to achieve the objectives.**
 - **The Tropical Tunas Working Group plans to meet in 2013 to, in part, refine these study objectives of the Atlantic Ocean Tropical Tagging Program (AOTTP) and develop a focused Call for Tenders from experts in the field.**
- **Obtain and evaluate a detailed description of the methodologies and assumptions used by the Ghanaian Statistics Task Group prior to adopting the recommendations of that report.**



North Atlantic Albacore

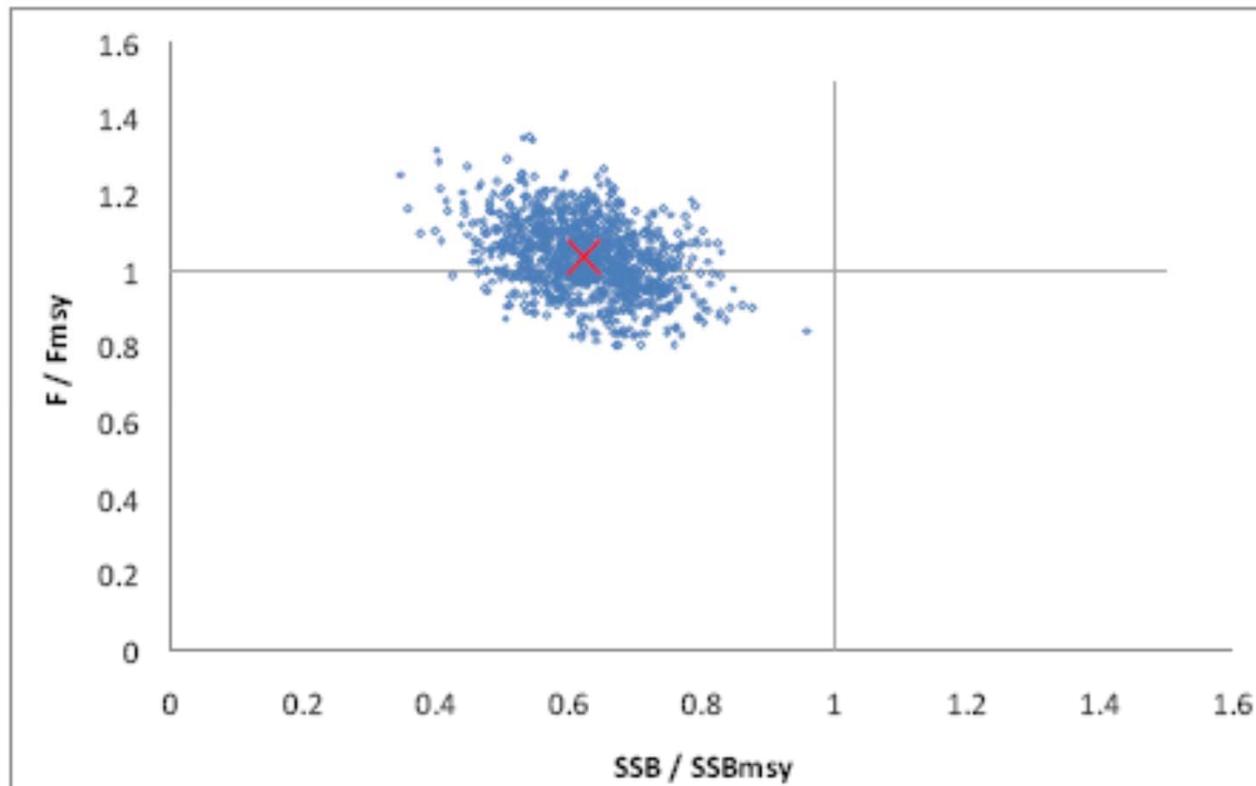
Catch (tons) by Fleet Type:

2006-2011 Catches below TAC





North Atlantic Albacore Stock Status Estimates from 2009 Assessment: **Model Uncertainty**



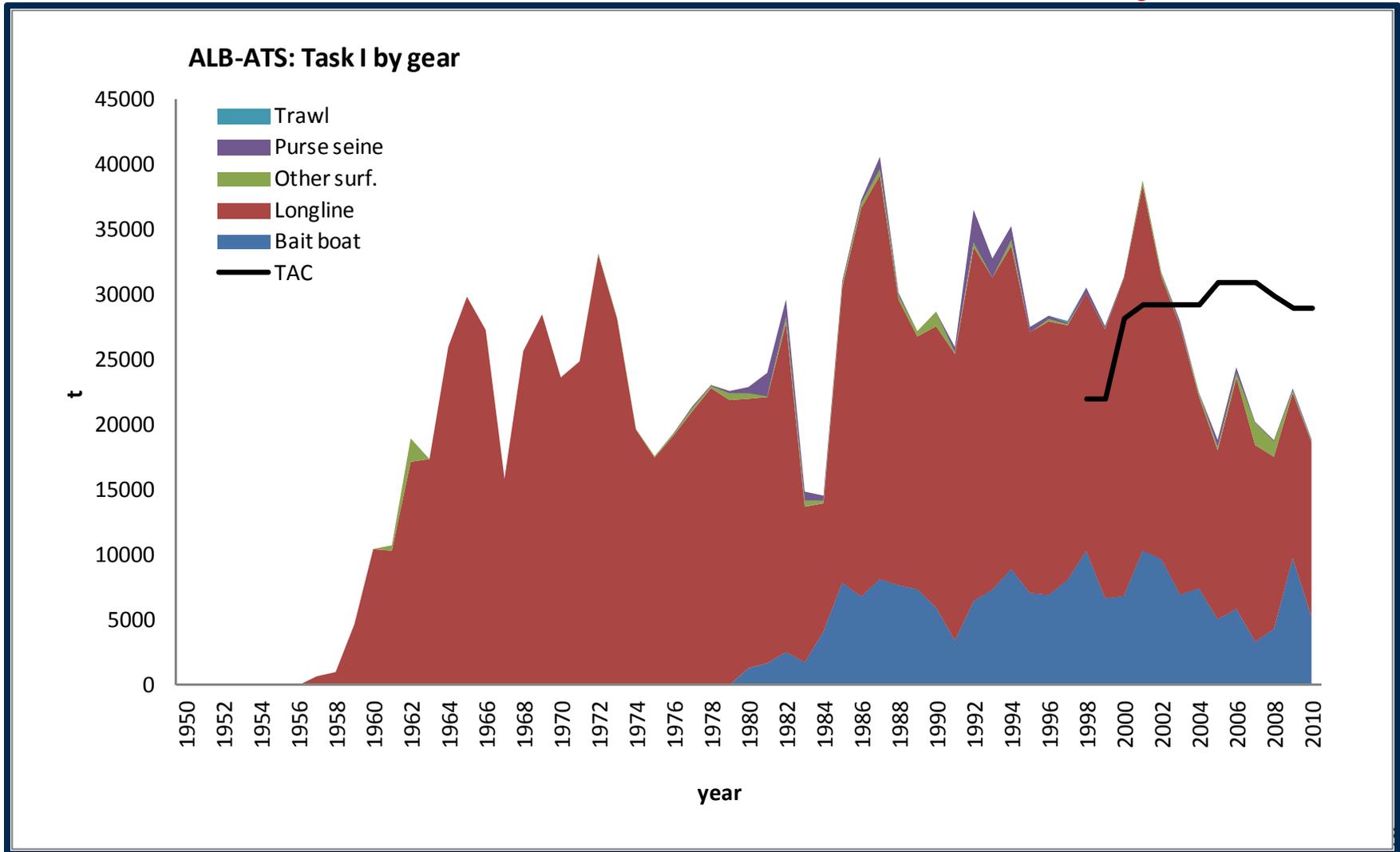
$F_{2007}/F_{MSY} = 1.05$ (80% CI = 0.85 to 1.23) = Near F_{MSY}
 $SSB_{2007}/SSB_{MSY} = 0.62$ (80% CI = 0.45 to 0.79) = Overfished



South Atlantic Albacore

Catch (tons) by Gear:

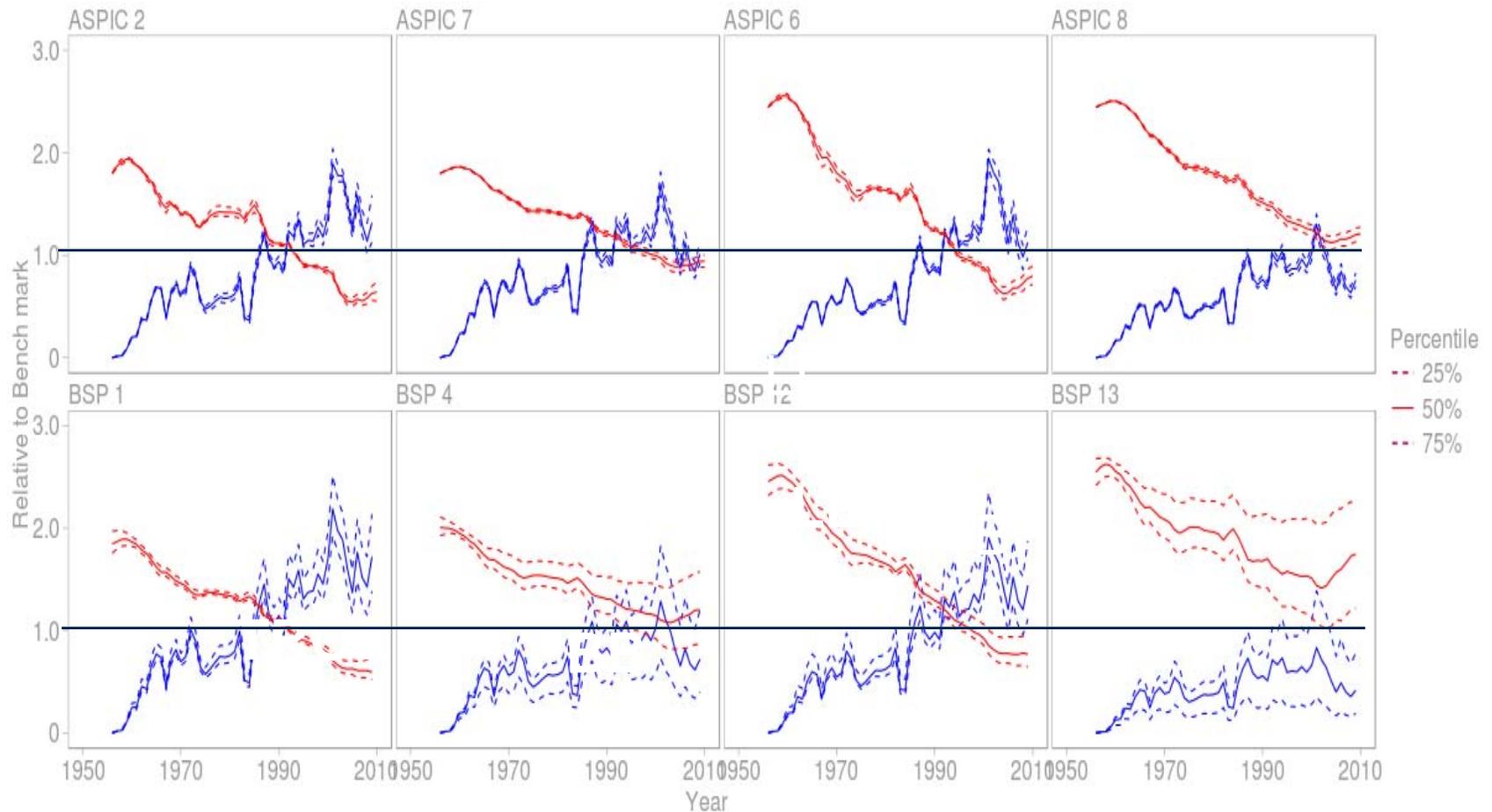
Also below TAC in recent years





South Atlantic Albacore Stock Status (2011 Assessment):

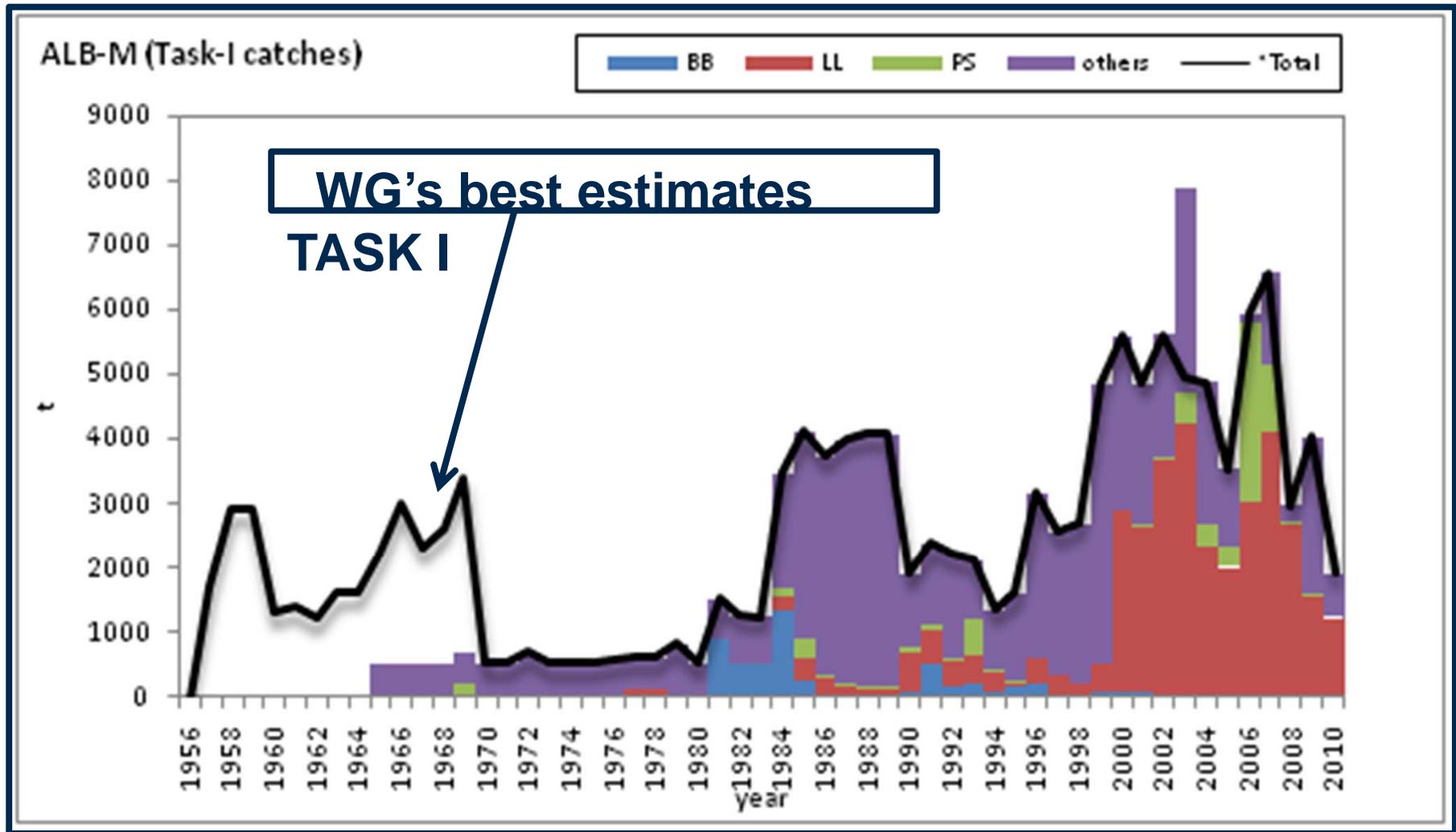
Likely Overfished, Sensitive to Assumptions



$$\frac{SSB_{2009}}{SSB_{MSY}} \quad \frac{F_{2009}}{F_{MSY}}$$



Mediterranean Albacore Catches (t) by Gear





Mediterranean Albacore Assessment Summary

- *relatively stable pattern for Mediterranean albacore biomass over the recent past*
(very little quantitative information was available to SCRS for use in conducting a robust quantitative characterization on biomass status relative to Convention Objectives)
- *recent fishing mortality appears to have been reduced compared to the early 2000's , a period where the stock was likely overfished*



Albacore Assessment Summary

ATLANTIC AND MEDITERRANEAN ALBACORE SUMMARY

	North Atlantic	South Atlantic	Mediterranean
Current (2011) Yield	19,995 t	24,078 t	4,660 t
Maximum Sustainable Yield	29,000 t	<u>27,964(23,296-98,371) t</u> 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		<u>0.88 (0.55-1.59)</u> ¹	
Relative Fishing Mortality			
F_{2007}/F_{MSY} ²	1.05 (0.85-1.23) ²		≤ 1 ³
F_{2009}/F_{MSY} ¹		<u>1.07 (0.44-1.95)</u> ¹	
Management measures in effect	[Rec. 98-08]: Limit No. of vessels to 1993-1995 average TAC: 28,000 t [Rec. 09-05] for 2012 and 2013.	[Rec. 11-05]: Limit Catches to 24,000 t For 2012 and 2013	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 Albacore Recommendations

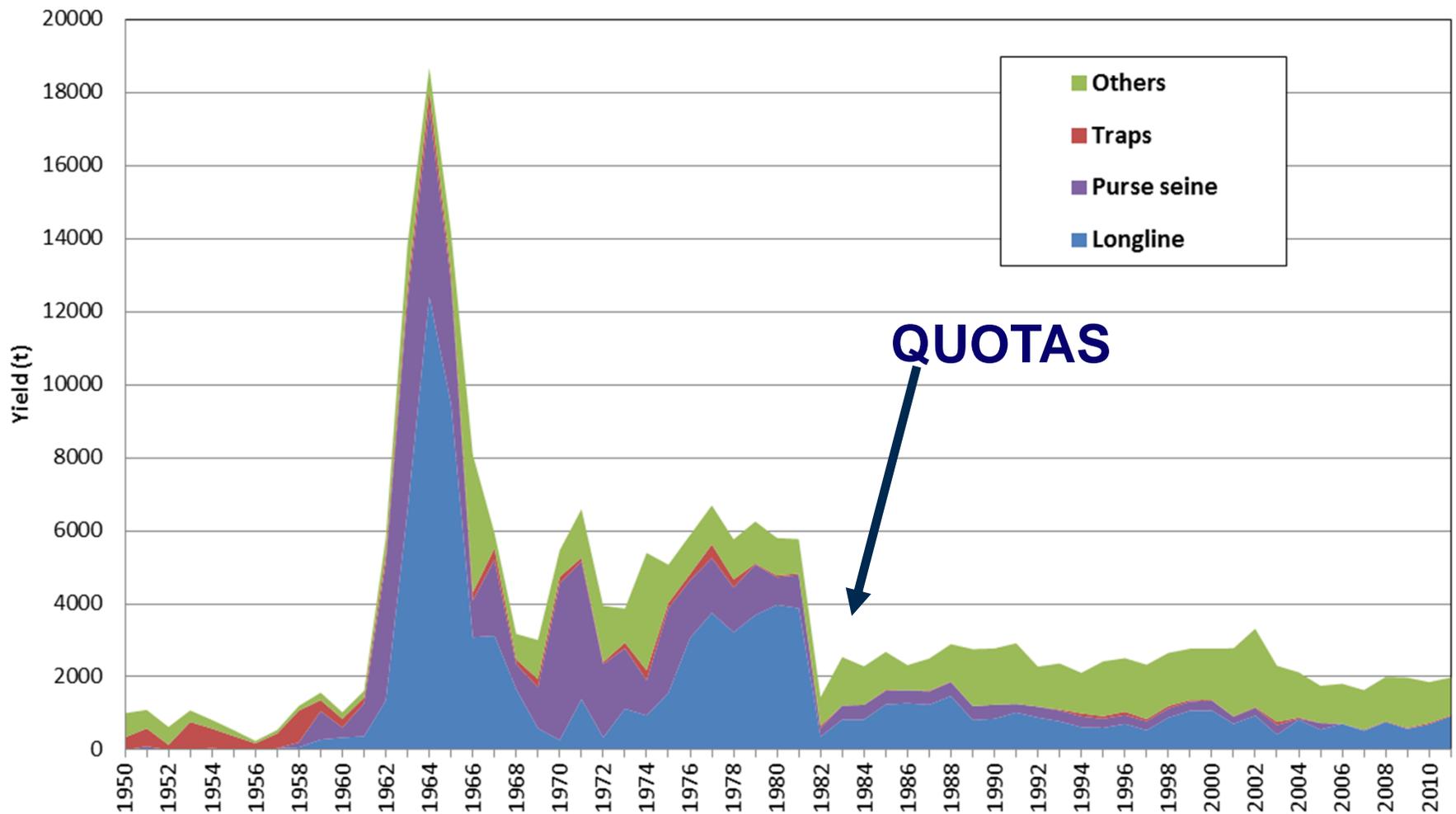
- Requests Cooperating and Contracting Party participation in 2013 stock assessment for North and South albacore; low attendance was cited as a hindrance to the previous assessments.
- Reinforces the recommendation for a research program for North Atlantic albacore focused on biology and ecology, fisheries data, and management advice.
- 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 tunas. 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.



2012 Update Assessment of Western Atlantic Bluefin Tuna

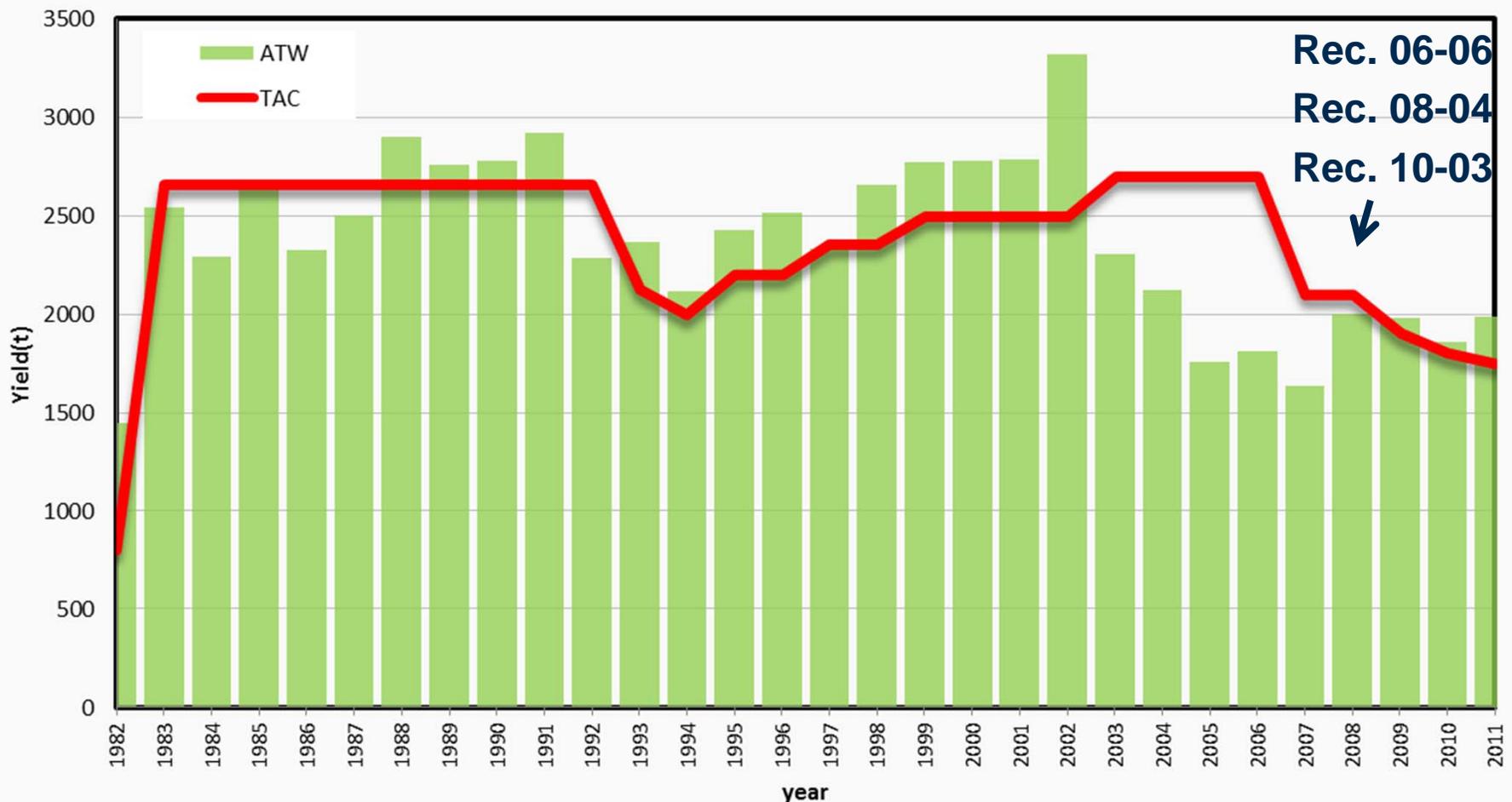
CATCH

BFT-WEST Atlantic stock (Task-I) by major gear



TOTAL ALLOWABLE CATCH

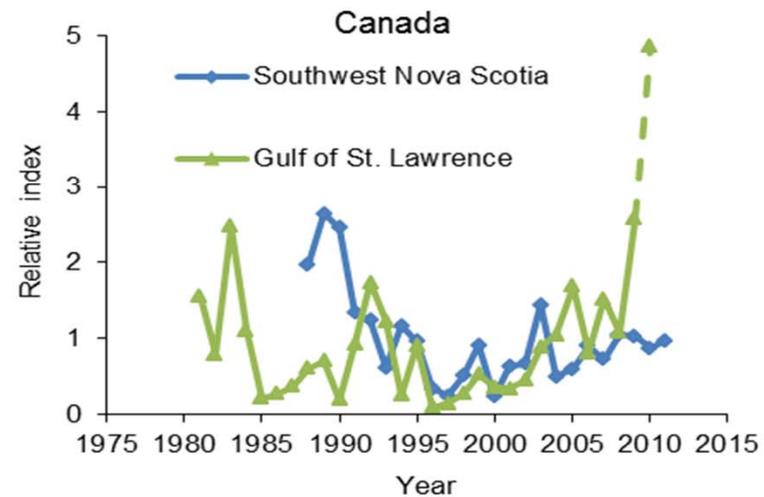
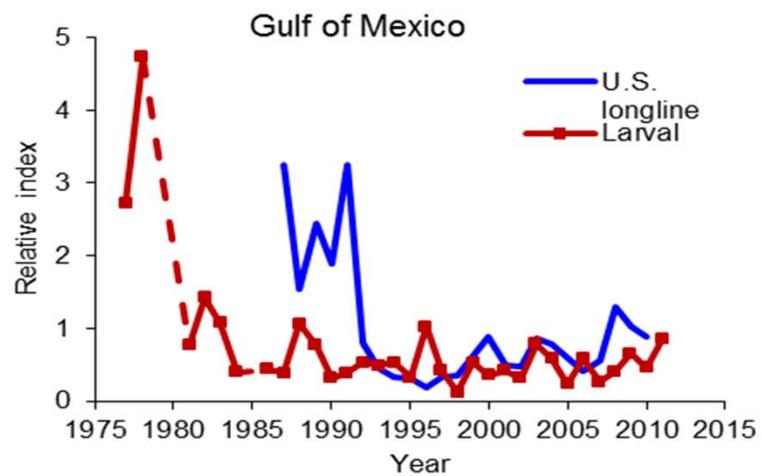
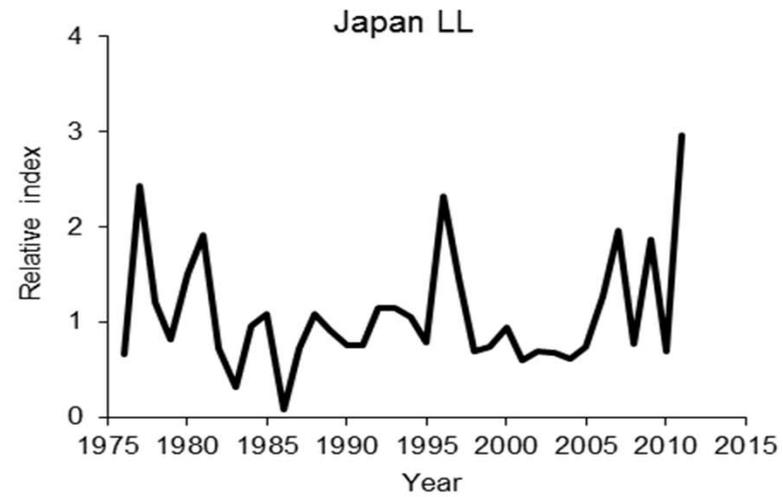
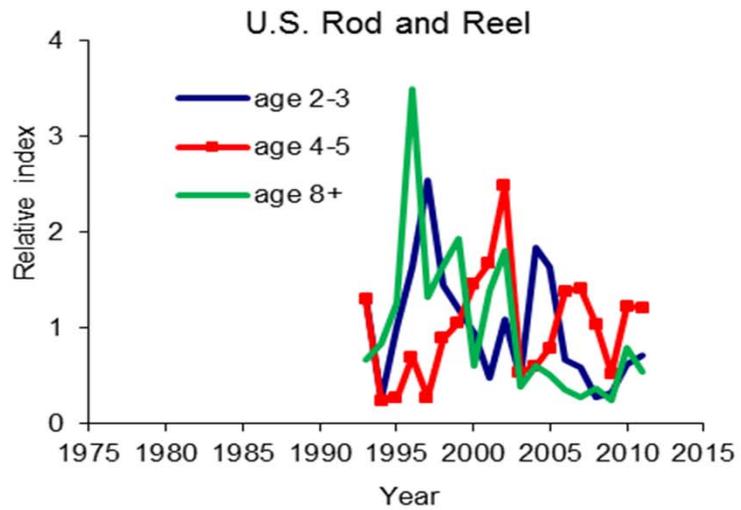
BFT-WEST Atlantic stock (Task-I) total catch & TAC's



Rec. 06-06
Rec. 08-04
Rec. 10-03



FISHERY INDICATORS



BIOLOGY

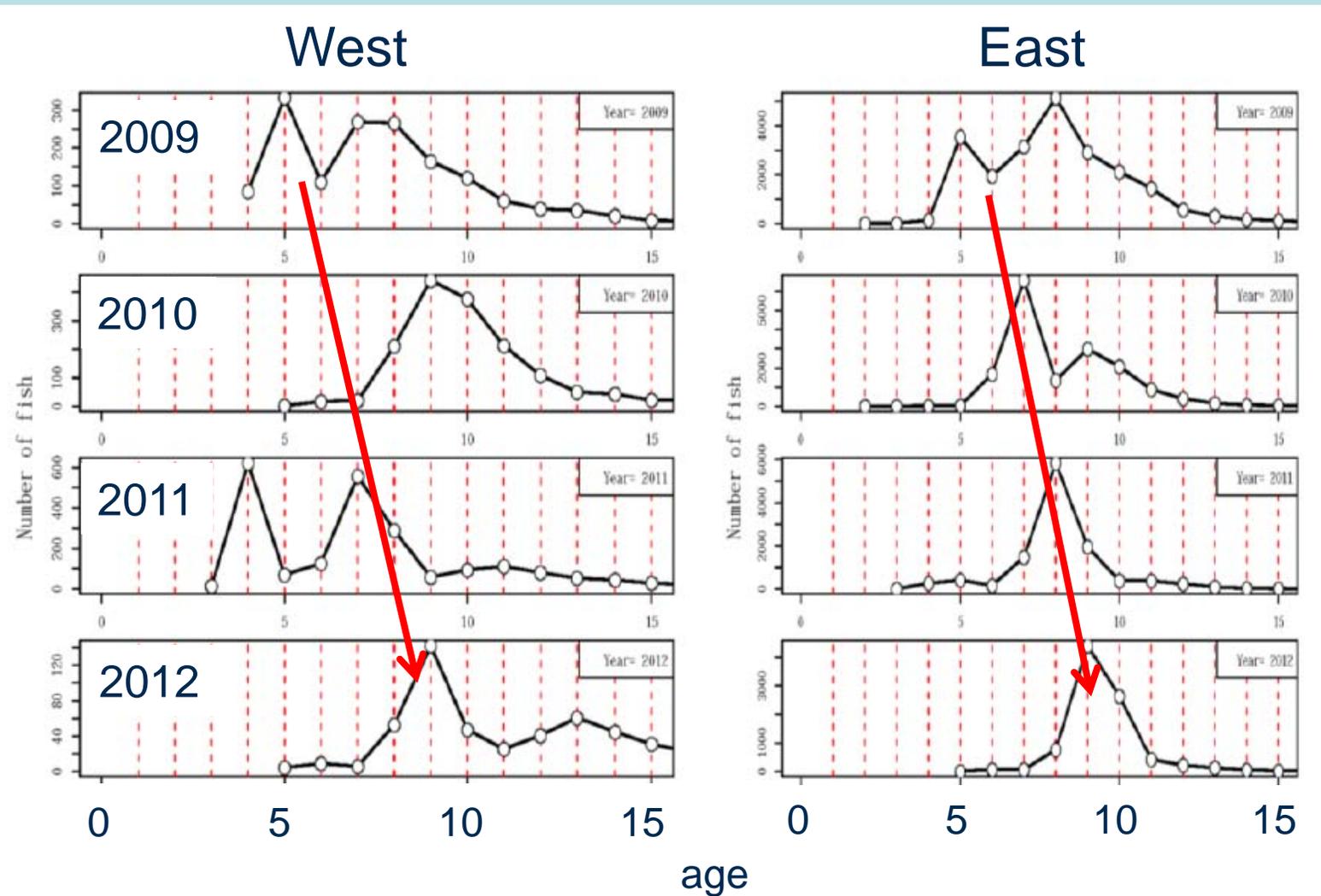
Stock Structure

Otolith microchemistry analyses indicate many juvenile BFT caught in the west originated from the Mediterranean Sea. Strong 2003 year-class may be *partly* eastern fish

Year-classes	Location	n	east	west
2003	Virginia and NC	39	51%	49%
2002 & 2004	Virginia and NC	37	59%	41%
1994-2009	Virginia and NC	218	72%	28%
1986-1992	Mid Atlantic Bight	54	22%	78%

BIOLOGY

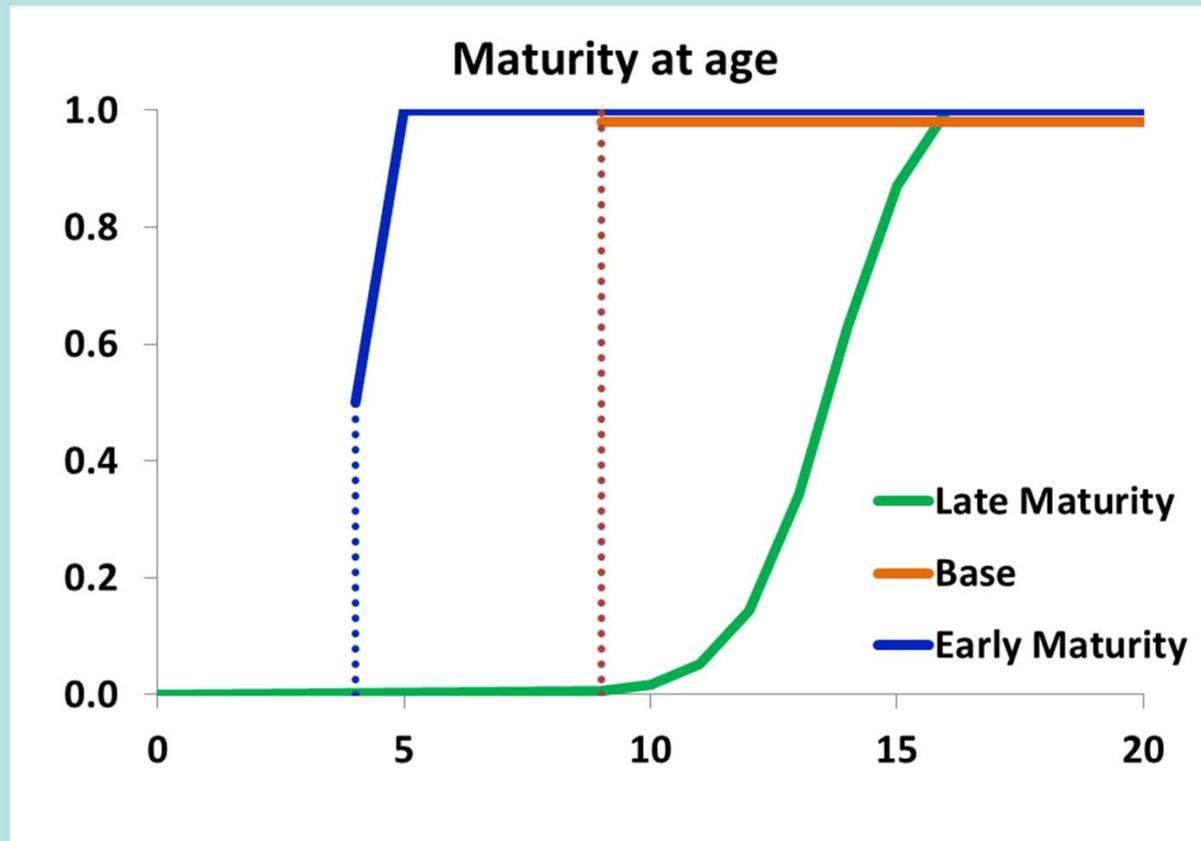
Evidence of strong 2003 year-class in east and west LL catch



BIOLOGY

MATURITY

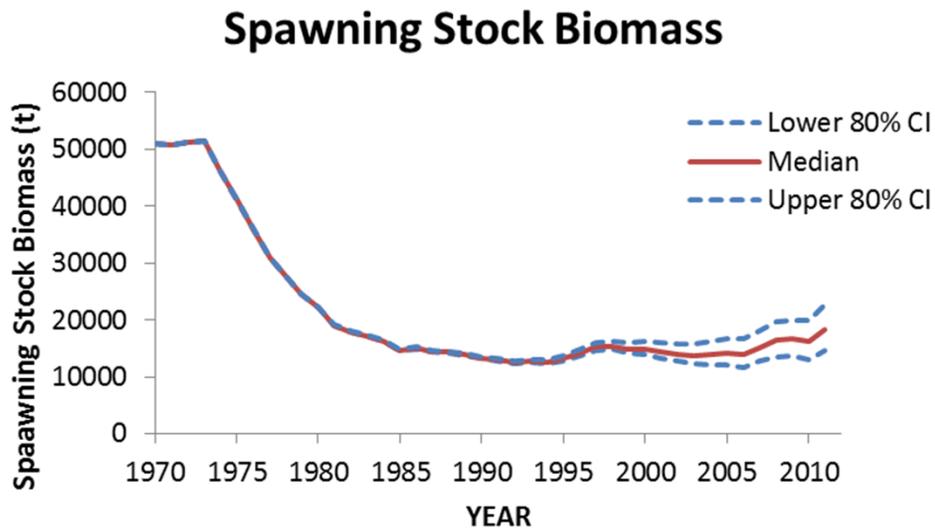
New information suggests individuals as small as 134 cm are mature (5 yrs old)



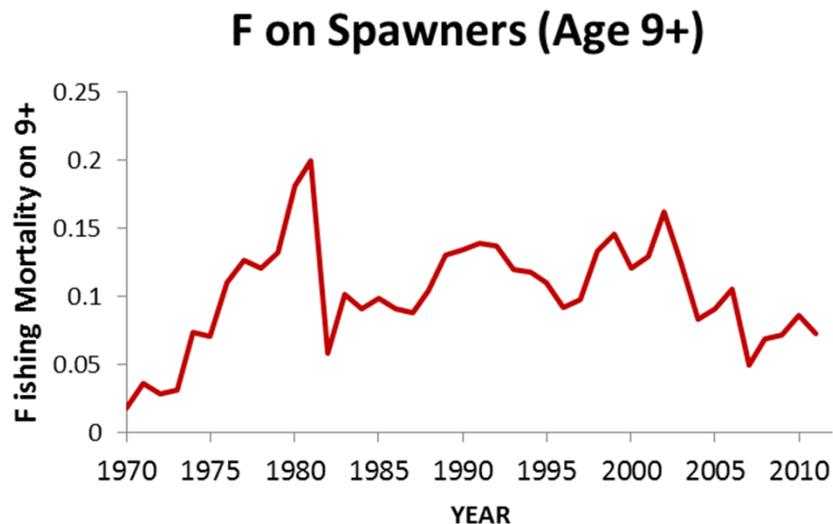
ASSESSMENT METHODS

- **The work plan for 2012 stipulated that the stock assessment should focus on updating the analyses conducted in 2010 that were used to provide management advice (there was not enough time to collect and analyze the new data coming from GBYP and other programs)**
- **Tuned virtual population analyses (VPA) were conducted with the same parameter specifications and data series used in the 2010 base-case assessment.**

STATUS OF STOCK

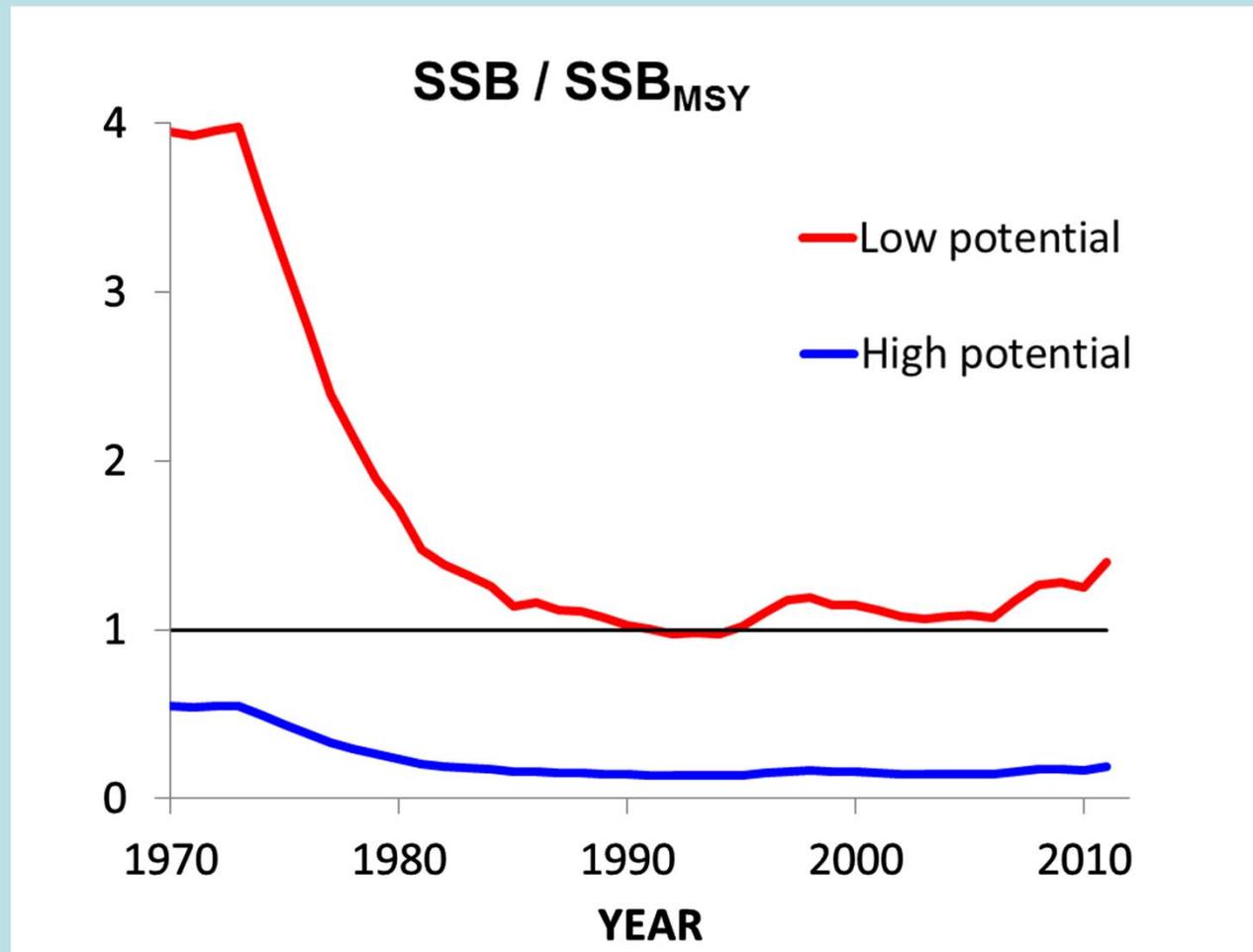


Estimates of spawning stock biomass show continued progress towards rebuilding (2011 SSB %18 greater than in 1998)



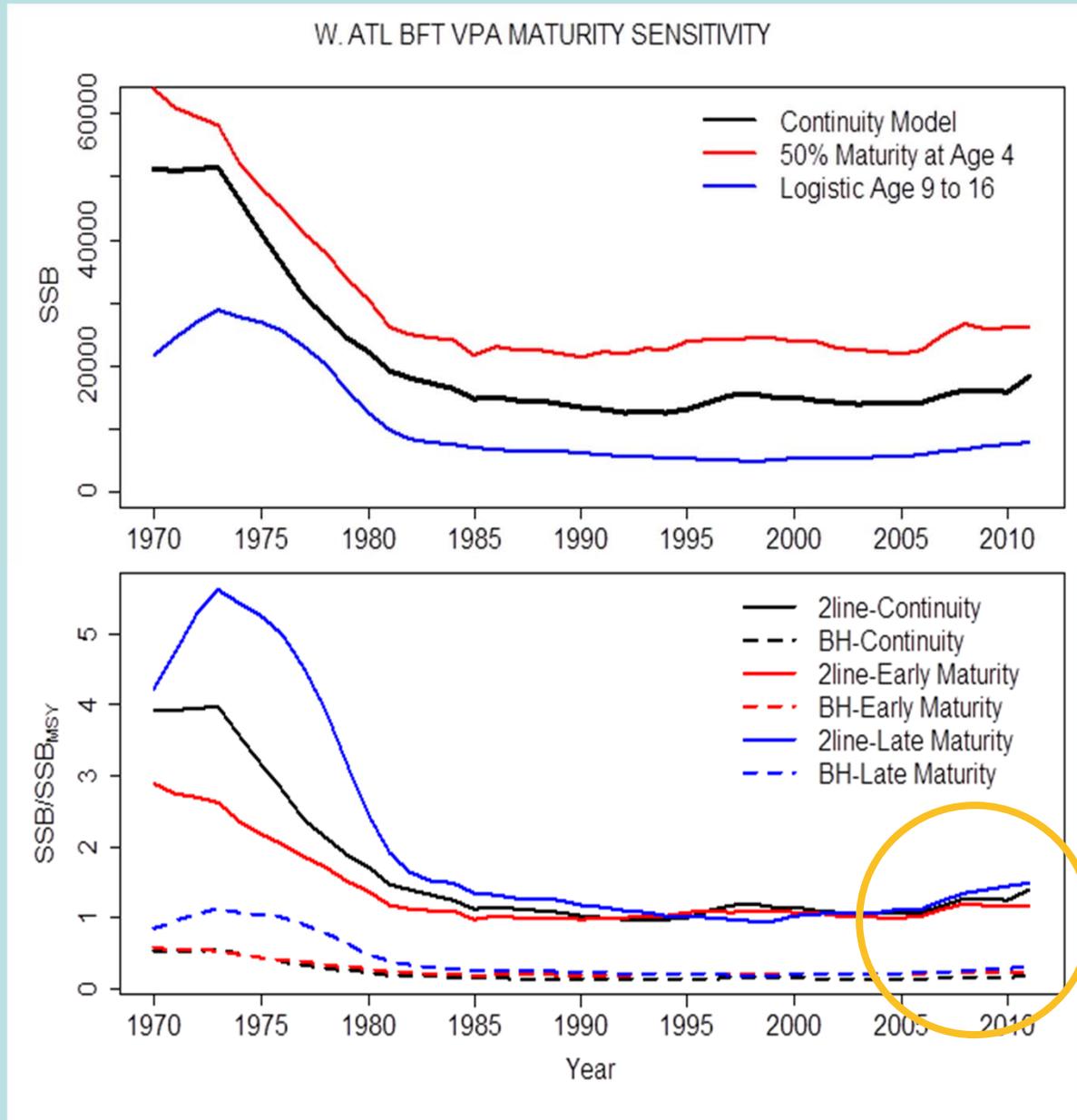
Estimates of fishing mortality on spawners show decrease in recent years

STATUS OF STOCK



Spawning biomass estimates are sensitive to maturity assumptions (more age classes = more biomass) but...

Stock status estimates are not

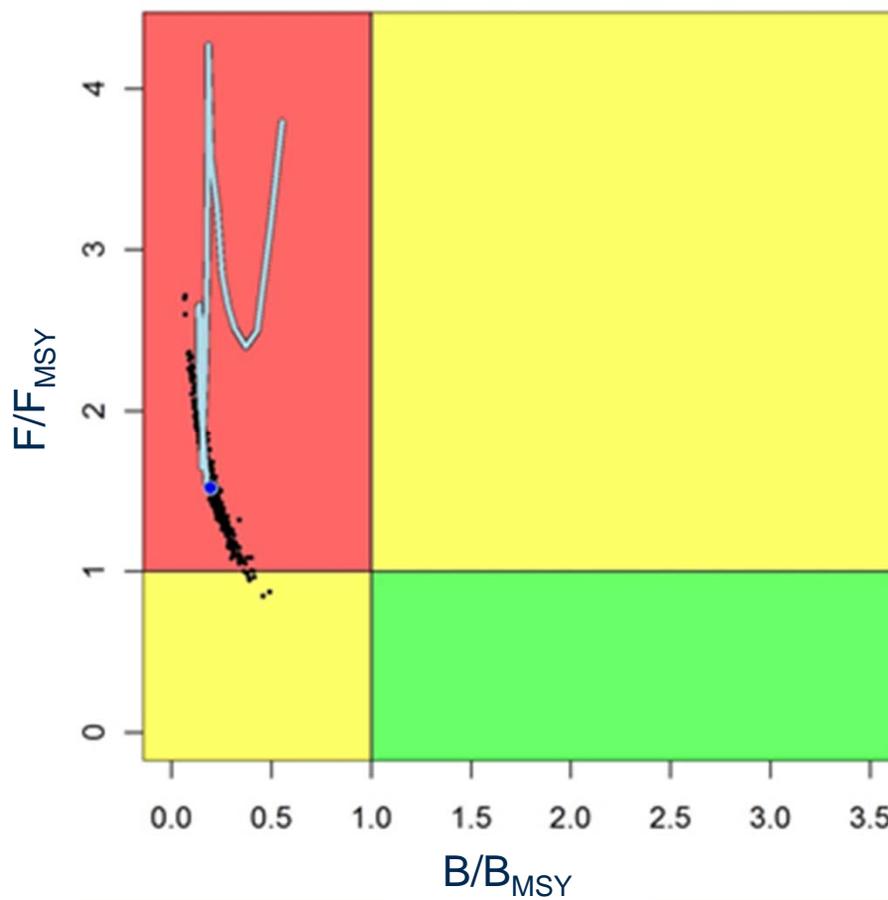
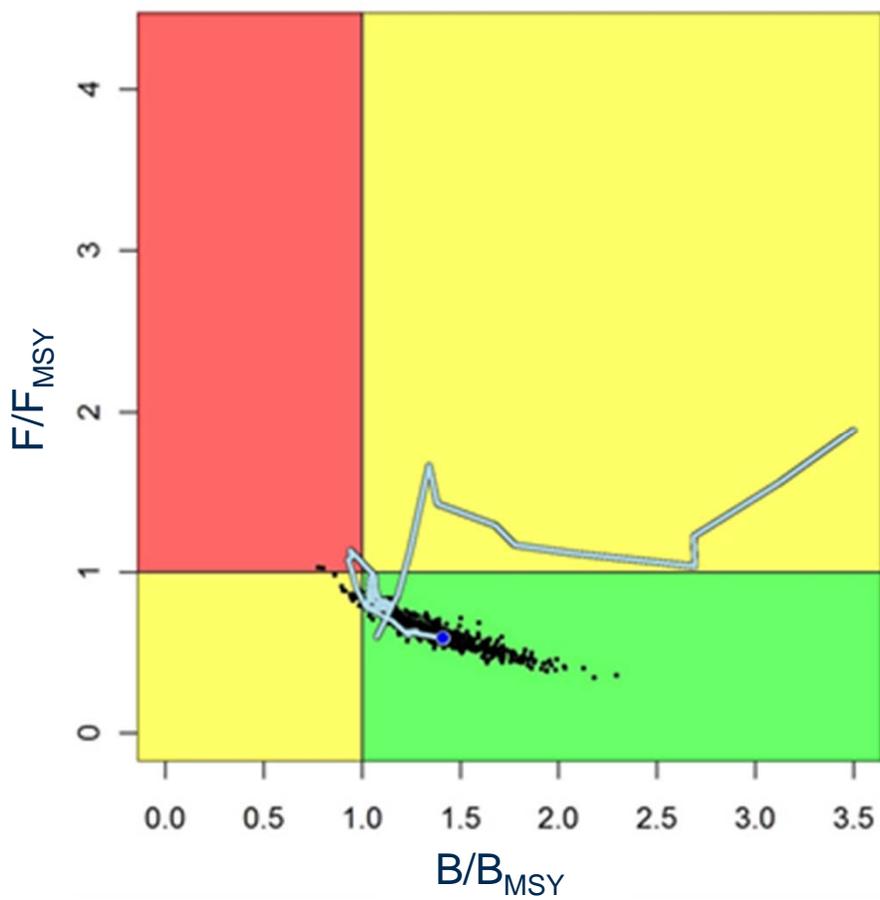


LOW RECRUITMENT POTENTIAL

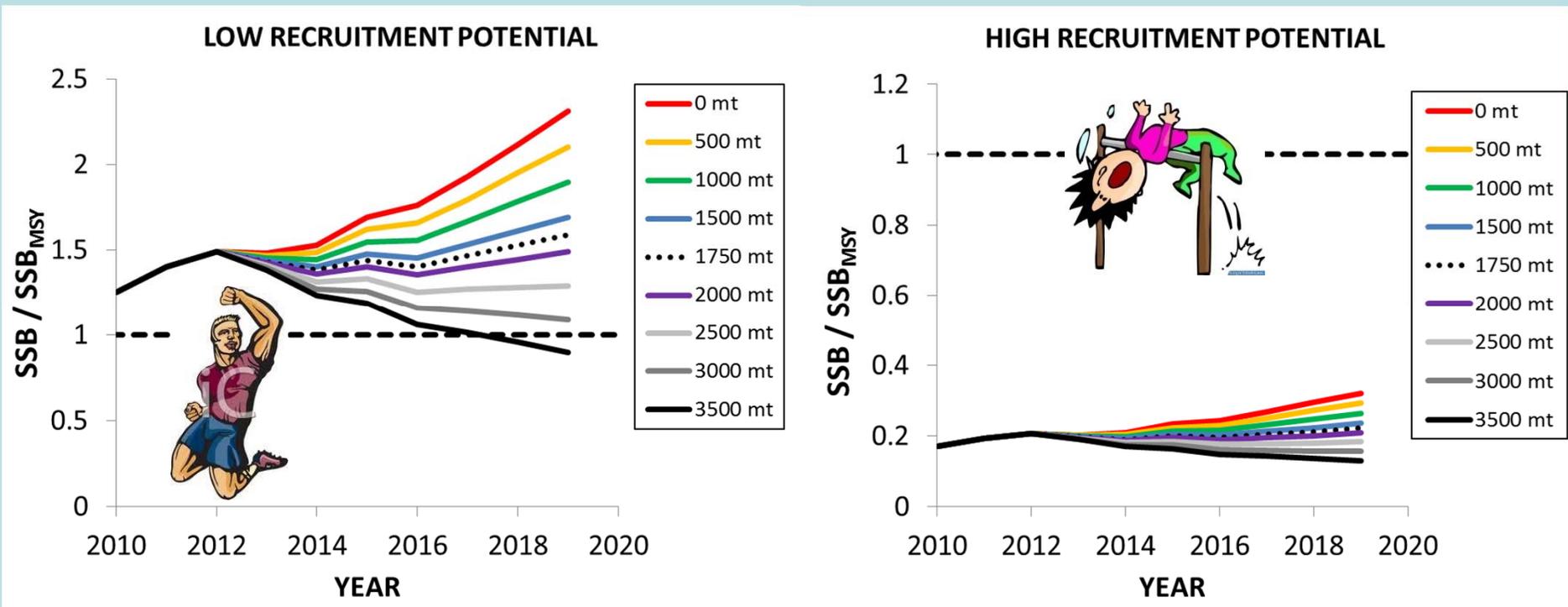
$F/F_{MSY}=0.6, B/B_{MSY}=1.4$

HIGH RECRUITMENT POTENTIAL

$F/F_{MSY}=1.6, B/B_{MSY}=0.19$



PROJECTED OUTLOOK



DRAFT MANAGEMENT ADVICE

- *Low recruitment scenario* suggests that biomass is currently sufficient to produce MSY, whereas the *high recruitment scenario* suggests that B_{MSY} has a very low probability of being achieved within the rebuilding period
- Despite this uncertainty, maintaining catch at current levels (1,750 t) is expected to allow the spawning biomass to increase
- Allowing spawning biomass to increase further may help resolve the issue of low and high recruitment potential. If the high recruitment hypothesis is correct, allowing substantial increases in spawning biomass should lead to higher recruitment (and, ultimately, higher sustainable yields)

RESEARCH RECOMMENDATIONS

- **Better data: fishery independent information (from large-scale tagging programs and aerial surveys), continued biological sampling (e.g., otoliths, reproductive tissues), recovery of historical records**
- **Intercessional meeting in early 2013 to evaluate the new biological information (growth, ageing, maturity, reproduction) coming from GBYP and other ongoing research projects. This meeting should also evaluate the reliability of existing inputs to stock assessment**
- **Two modeling meetings, in 2013 and in 2014, to advance assessment methods' refinement for BFT stocks.**

An underwater photograph of several Eastern Atlantic Bluefin Tuna swimming in clear blue water. The fish are shown in profile, with their sleek, silver bodies and prominent dorsal fins. The lighting is bright, highlighting the texture of their scales and the sharp points of their fins. The background is a uniform, deep blue, suggesting a clear ocean environment.

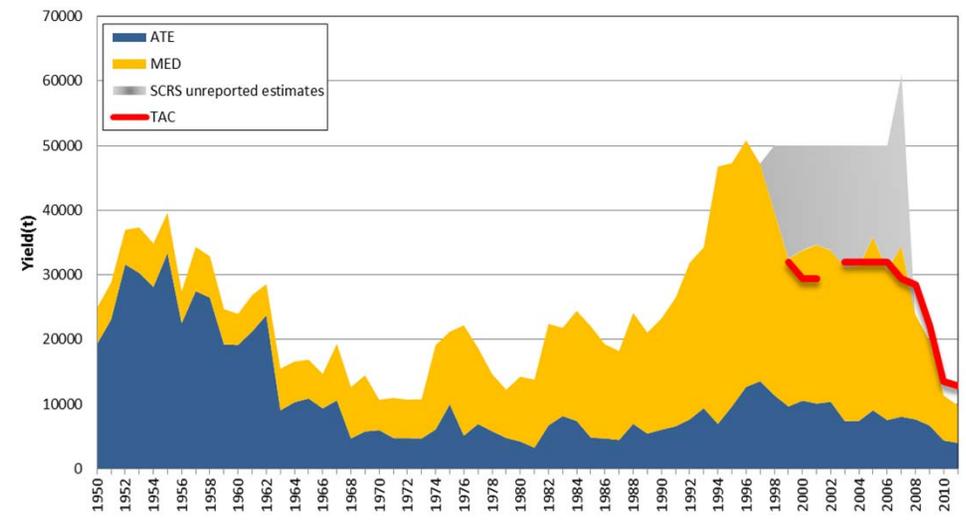
2012 Update Assessment of Eastern Atlantic Bluefin Tuna



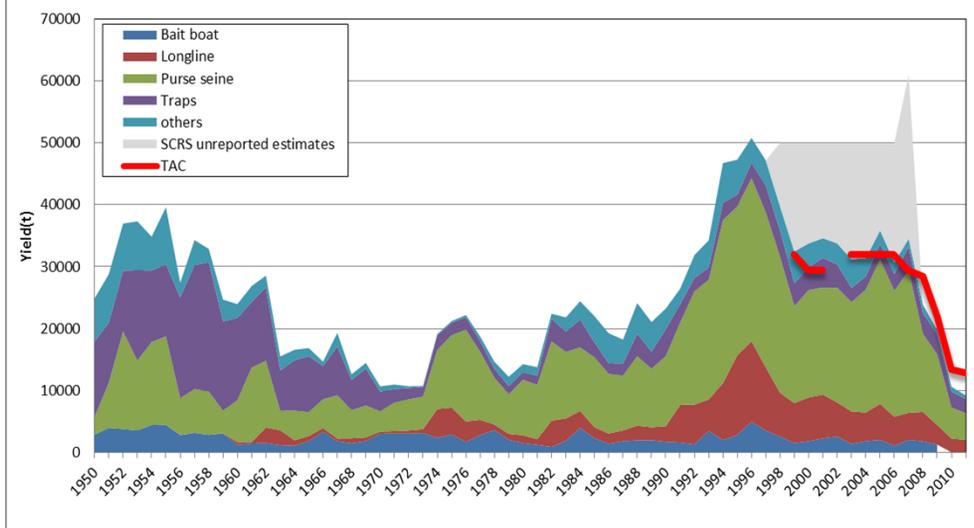
BFTE Catch Trends

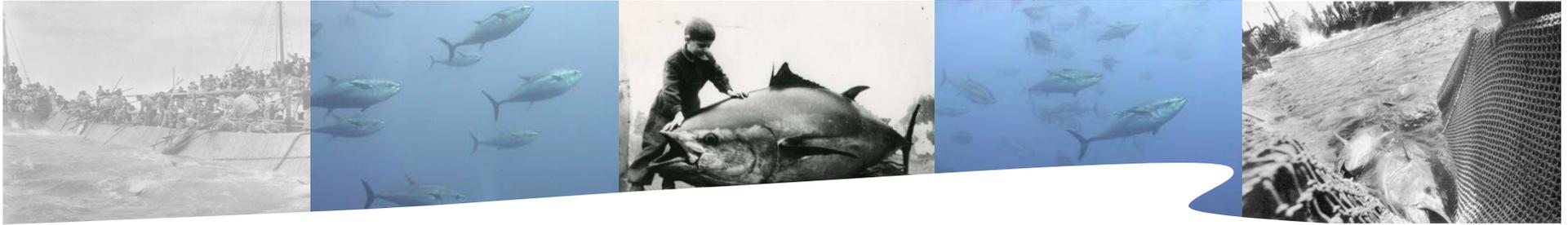
- The decrease in the catch have mostly occurred in the Mediterranean Sea, probably in **response to the rebuilding plan and control enforcement** since 2008
- In 2010, the Group did not detect any under-reporting in 2008 and 2009 when confronting reported catch with fishing capacity information
- No check for 2010 and 2011 because of the limits of the approach. **2011~ 9,800 t: lowest catch since 1950; ~ 20% of the catch in 2000s**
- The controversy about **potential IUU catch** in recent years needs to be investigated with more robust methods, e.g. using information from both trade statistics and BCDs

BFT -East Atlantic stock (Task-I) by region



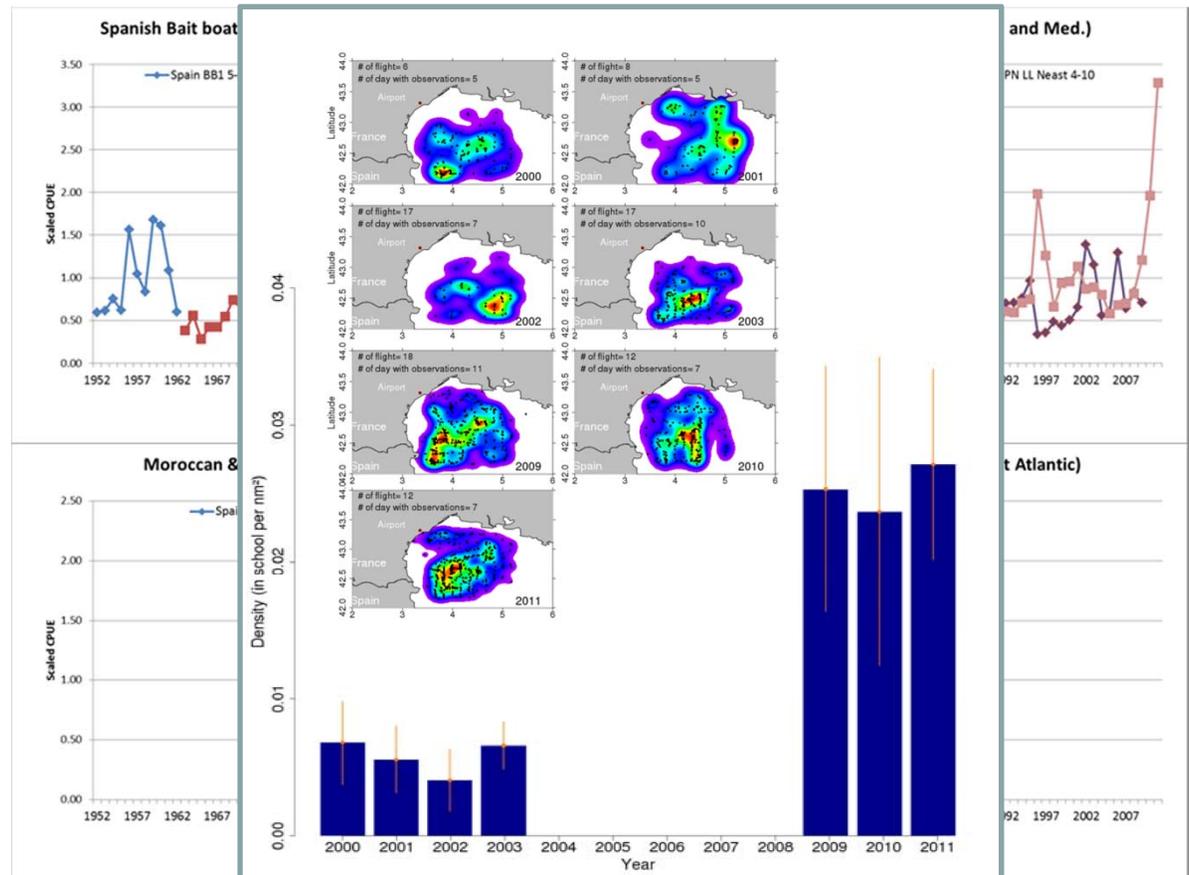
BFT -EAST Atlantic stock (Task-I) by major gear

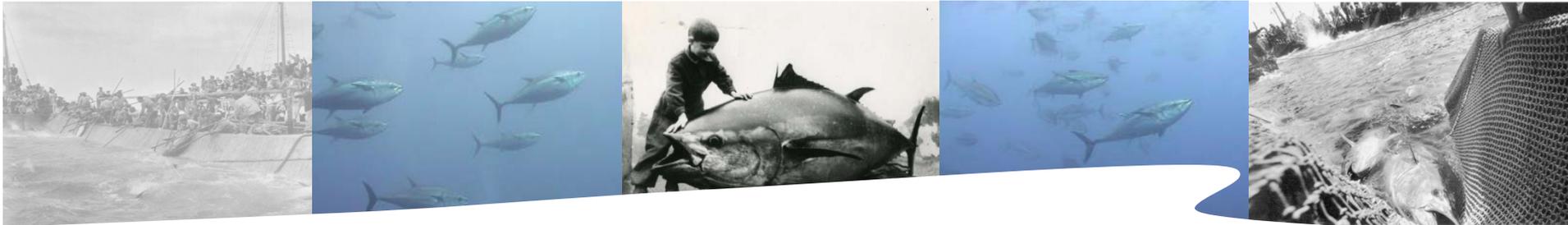




BFTE Fisheries Indicators

- All CPUE indices displayed positive trends in recent years
- Fisheries-independent information from aerial surveys performed on the juveniles in the Northwestern Mediterranean Sea provide similar indications
- The recent regulatory measures affect significantly the CPUE values through the change of operational pattern, length of the fishing season and target sizes
- Need for more precise scientific information about the main Mediterranean fisheries

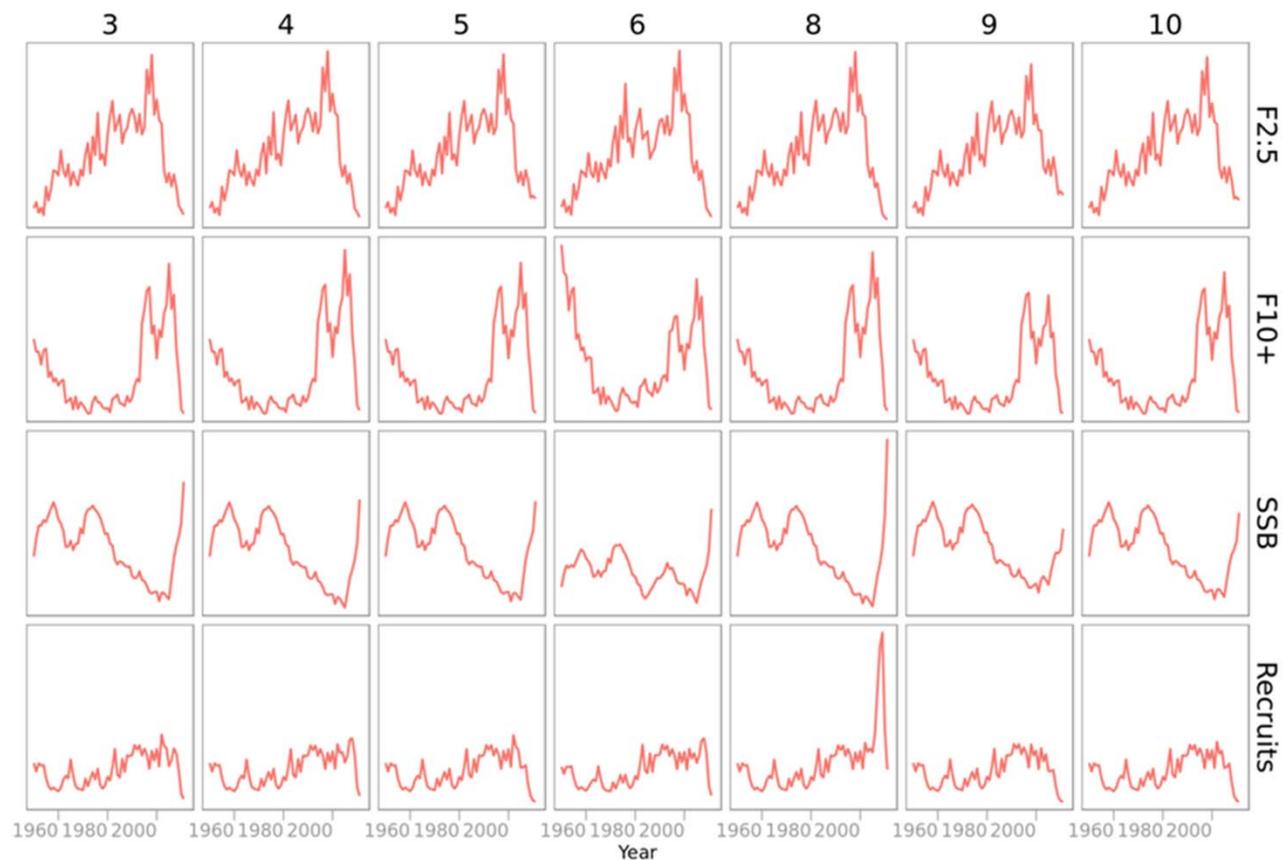




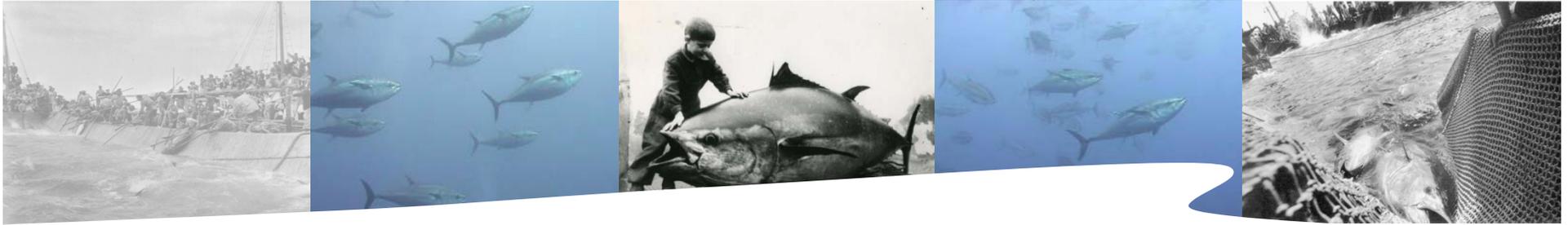
BFTE Stock Status

VPA sensitivity runs

- F_{10+} and F_{2-5} declined in all the runs investigated
- The SSB increased in all the runs investigated
- The magnitude and speed of the SSB recovery remain highly uncertain



Retro — 2011



BFTE Stock Status

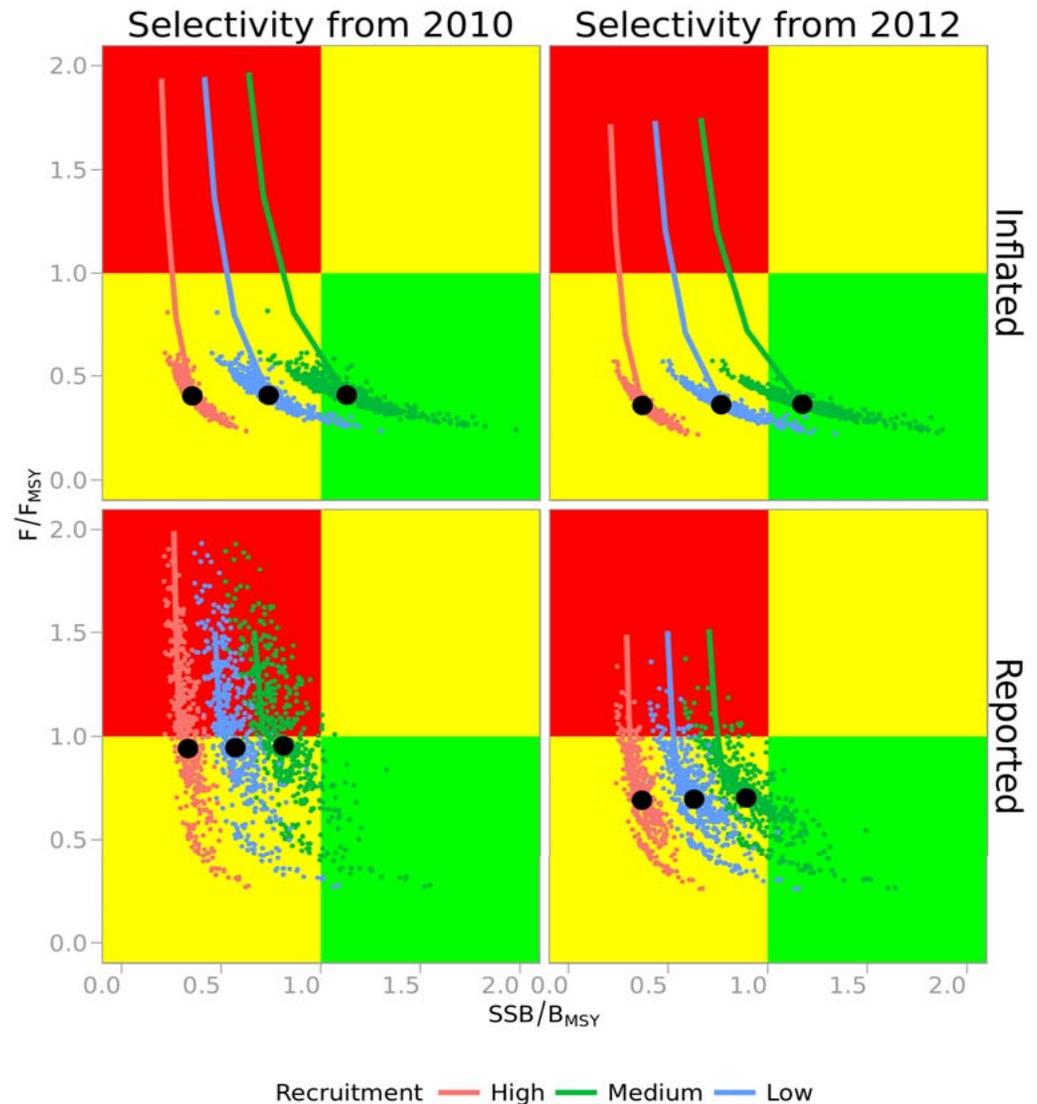
The stock status has significantly improved since 2010, as $F_{2011} < F_{0.1}$

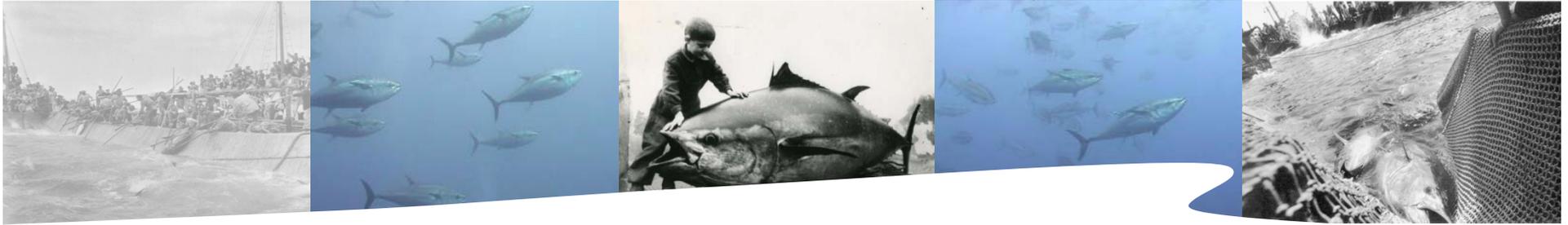
- $F_{2011}/F_{0.1} = 0.7$ (reported)
- $F_{2011}/F_{0.1} = 0.36$ (inflated)

SSB remained most likely under the level expected at $F_{0.1}$:

- $SSB_{2011}/SSB_{0.1} = 0.63$ (reported)
- $SSB_{2011}/SSB_{0.1} = 0.76$ (inflated)

However, those ratios depend on the mean recruitment levels. For the higher recruitment scenario, the perception is more pessimistic (~ 0.37) while it is more optimistic for the lower recruitment scenario (0.89)

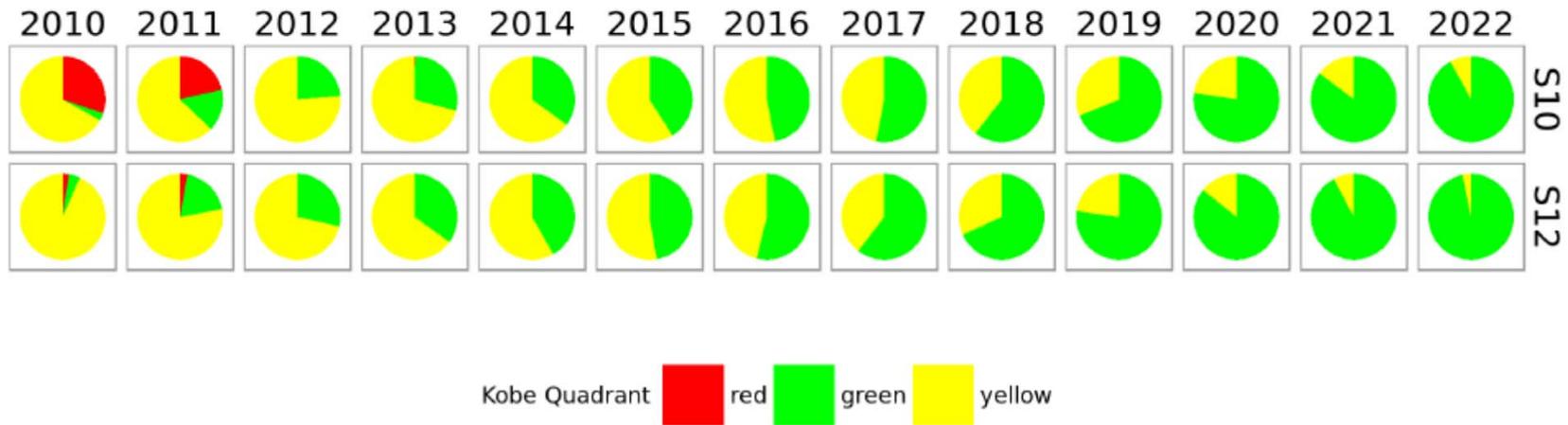




BFTE Projections

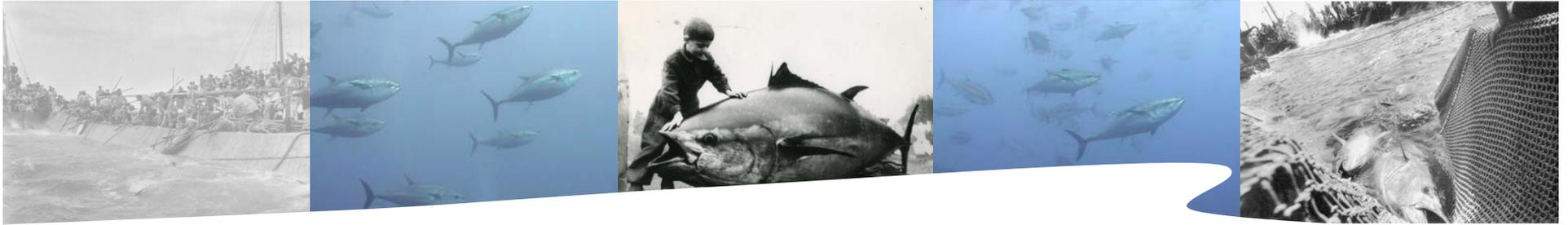
Proportion of the VPA continuity run results that are within the green/yellow/red quadrants of the Kobe plot chart, using the current TAC (12,900 t) up to 2022

Results integrated over the 3 recruitment (low, medium and high) and catch scenarios (reported and inflated), but split by selectivity patterns (and thus benchmarks)



The 2012 results confirm the conclusions made in 2010, i.e. the rebuilding of BFTE at $SSB_{F0.1}$ level with a probability of at least 60% could be achieved by 2022 for a TAC < 13,500t

The 2012 results also indicate that this level could be achieved before 2022



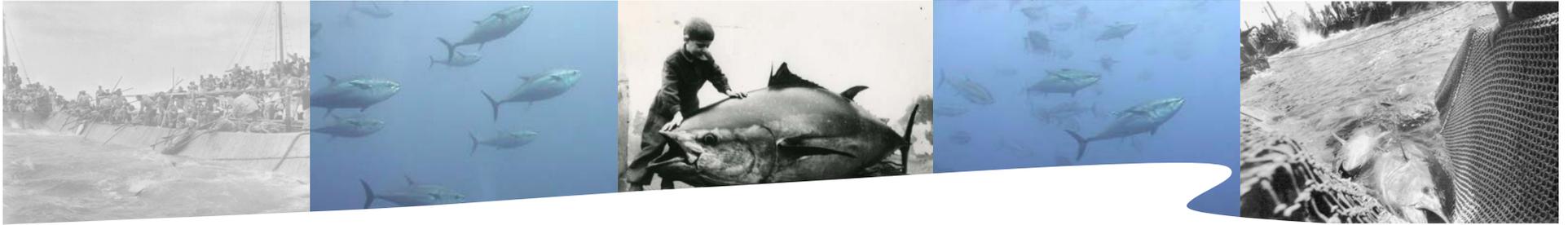
BFTE Projections

The Group has, however, **little confidence in the projection outputs and thus in the Kobé matrices** because of various and significant sources of uncertainties:

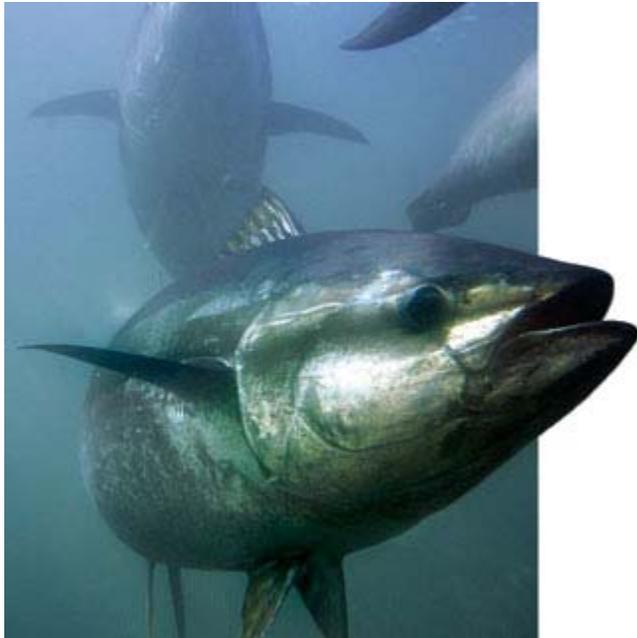
- VPA outputs are impaired by the poor quality of the catch statistics
- VPA outputs are highly sensitive to technical specifications (F-ratios, Plus Group...)
- The speed and magnitude of the rebuilding of the SSB remains uncertain
- Projections depend on the selectivity patterns chosen (benchmarks)
- Lack of scientific information about the main Mediterranean fisheries
- All CPUE indices are strongly affected by recent management measures
- Need for fisheries-independent information
- Key biological/ecological uncertainties to be solved (population structure, productivity, mixing...)



The VPA outcomes NEED to be confirmed by additional data (GBYP) and analyses (implying the use of alternative approaches)



Management Recommendations



Maintaining catches at the current TAC (12,900 t) or at the 2010 TAC (13,500 t) under the current management scheme will likely allow the stock to increase and is consistent with the goal of achieving F_{MSY} and B_{MSY} through 2022, or before, with at least 60% of probability, given the quantified uncertainties.

A period of stabilization in the main management regulations of the rebuilding plan would allow the SCRS to better estimate the magnitude and speed of recent trends in F and SSB in the coming years.



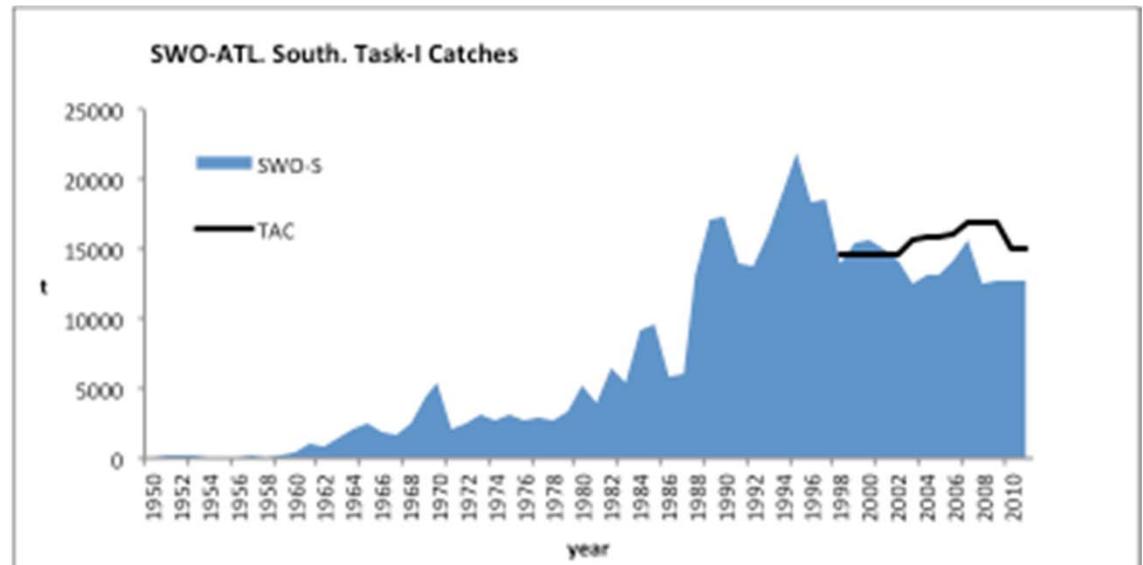
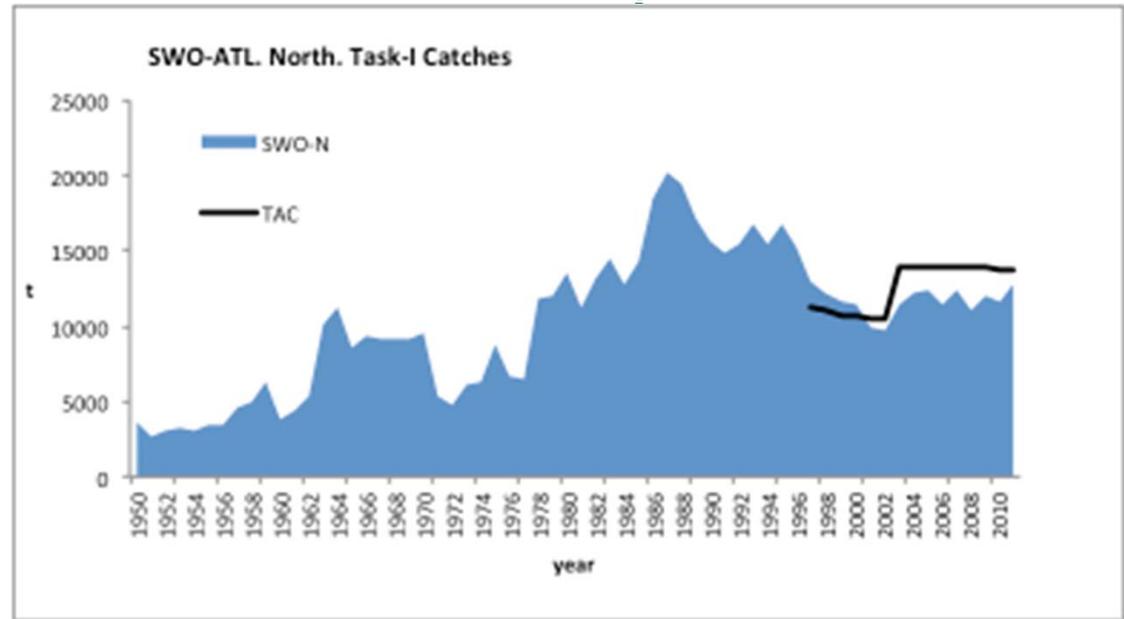
Swordfish





Landings in Relation to TAC, North and South

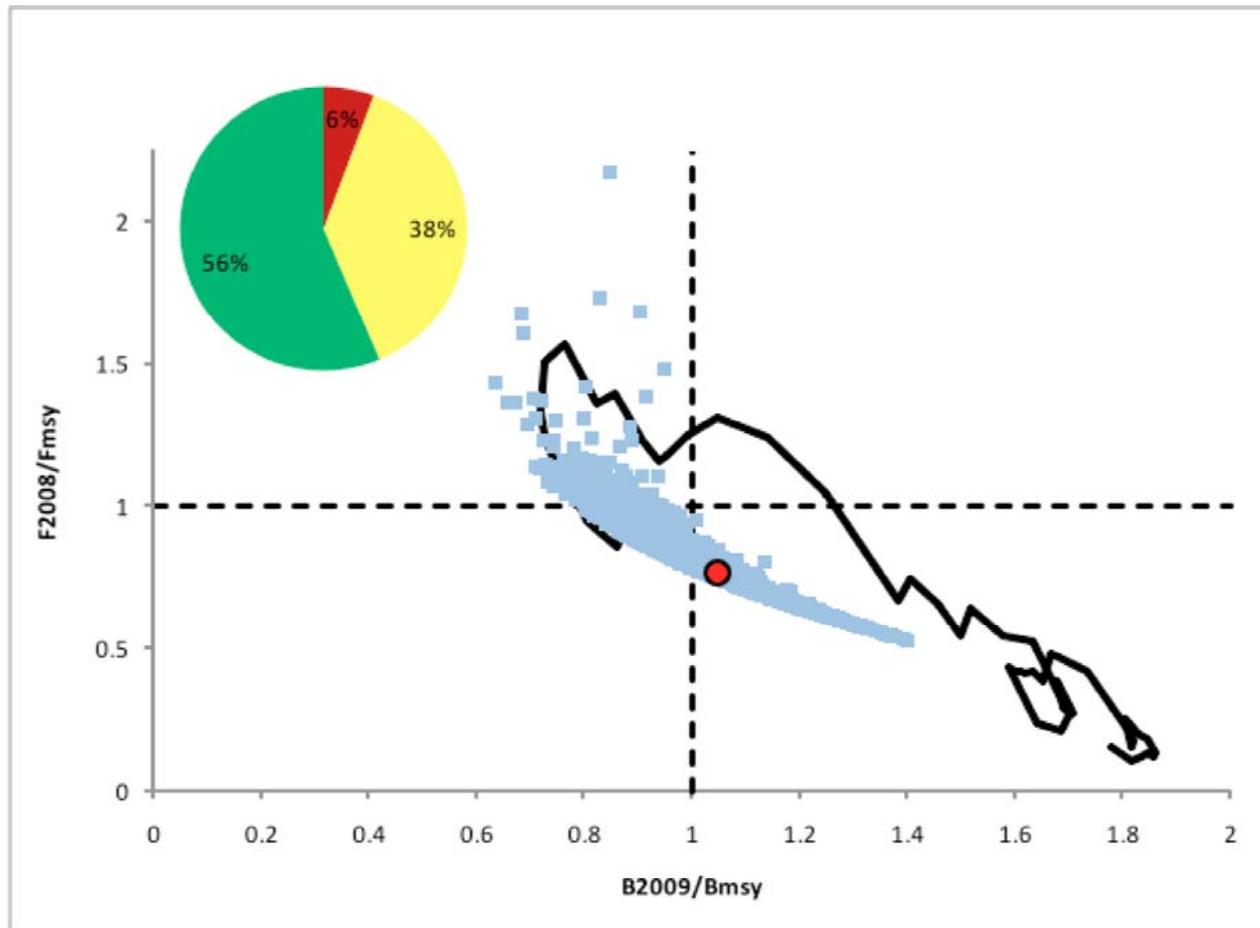
Recent catches in the North and South Atlantic have been less than TAC.





Stock Status, North- 2009 stock assessment

New assessment and data workshop in 2013



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

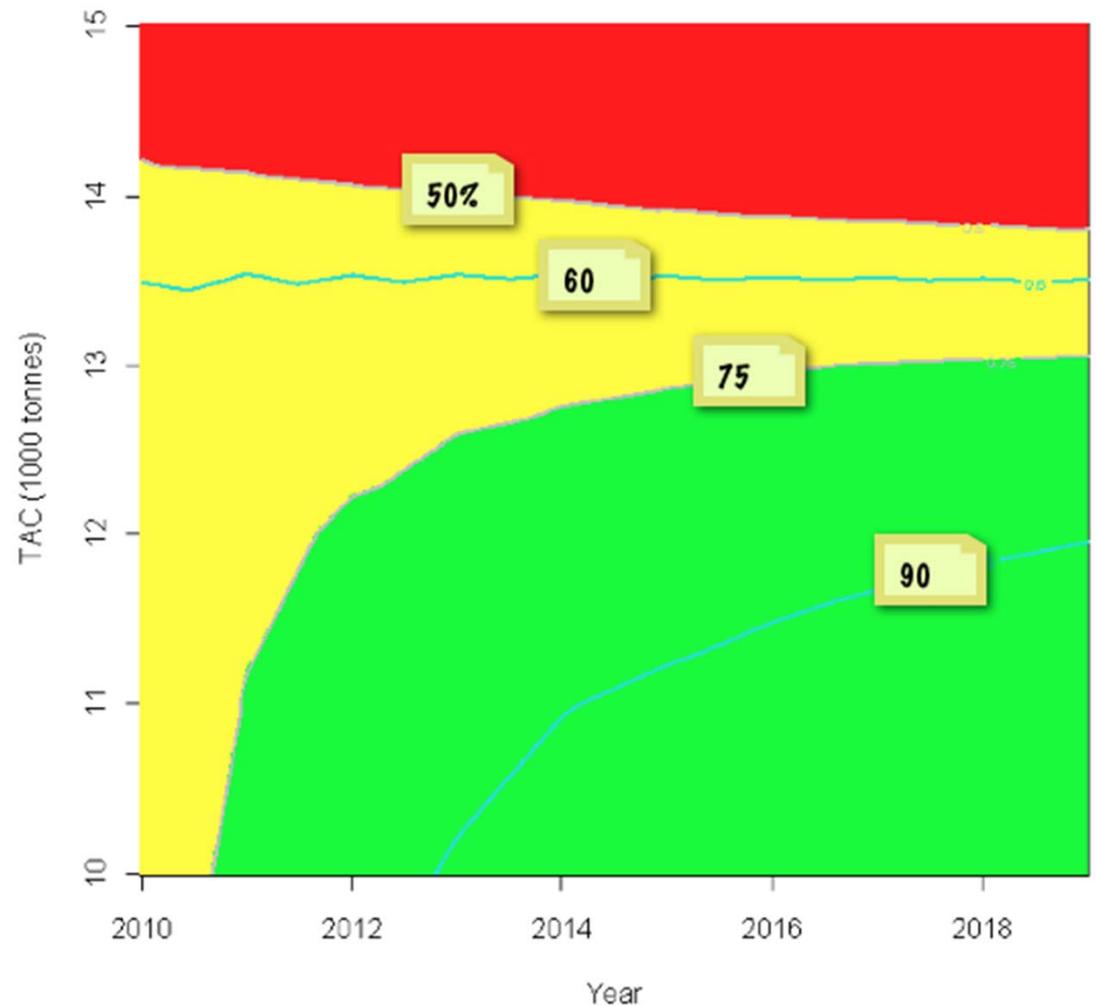


Probability of staying in the Rebuilt Zone

TAC of 13,000 t would provide ~75% probability of maintaining stock at Convention Objective over 10 years.

Cautionary note- negotiated catch limits (15,195 t) > TAC (13,700 t)

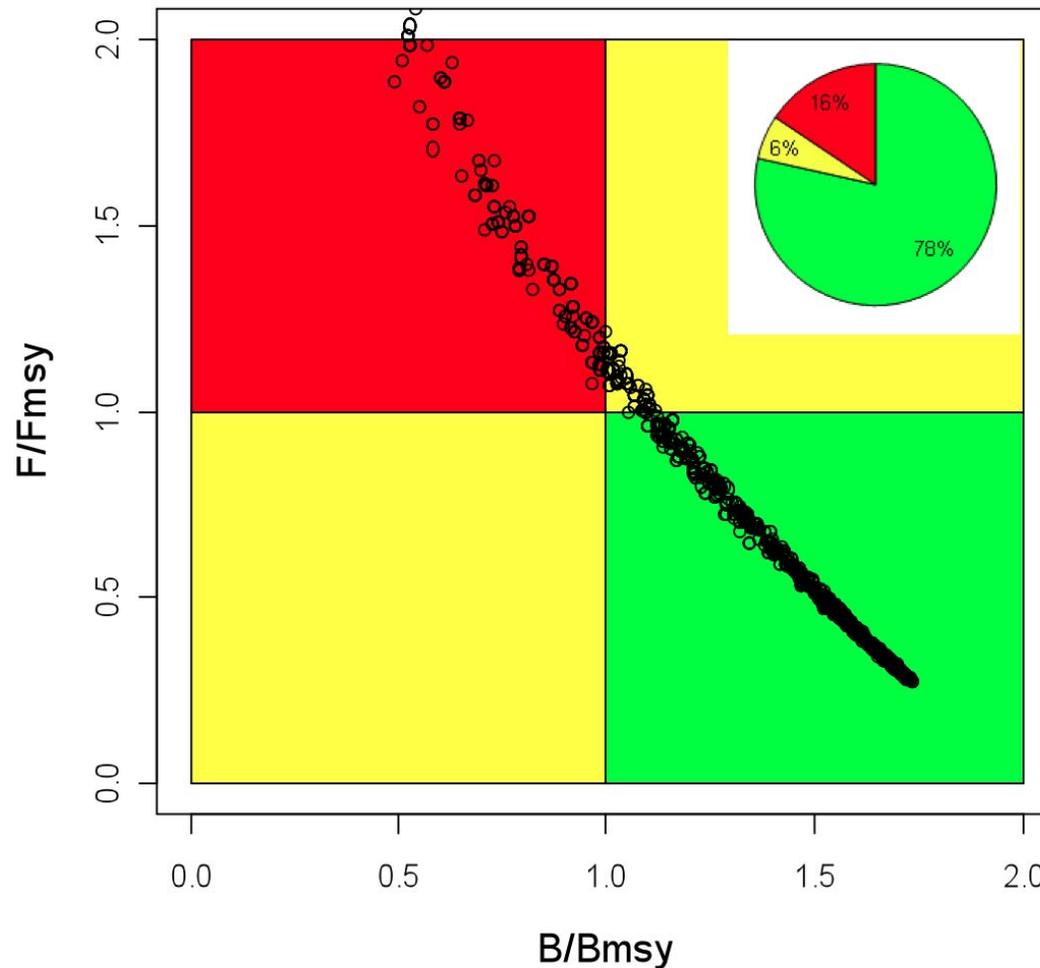
Rec 11-02 attempts remedy: if catch > TAC in 2012 or 2013, CPCs who have exceeded their individual adjusted catch limits shall pay back overharvest.





Stock Status, South-2009 stock assessment

New assessment and data workshop in 2013

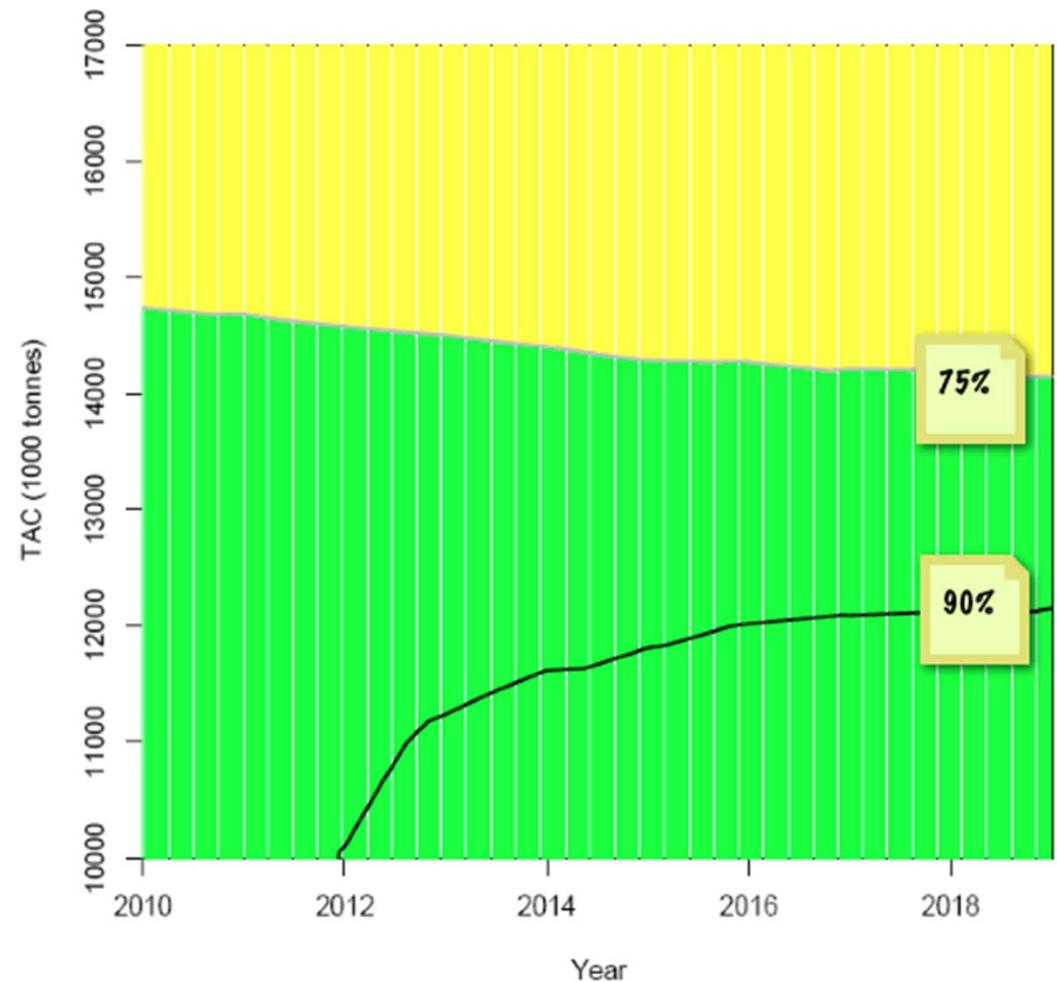


Conditioned only on catches, the model estimated a probability of 0.78 that stock is not overfished and it not ongoing overfishing *and thus stock is in zone consistent with Commission's objective.*



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

- Analysis (catch only model) 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.
- Committee recommends a precautionary approach, limiting catches to 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 (2011) TAC	13,700 t	15,000 t
Current (2011) Yield ²	12,836 t	12,763 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} ⁴)	0.76 (0.67-0.96)	0.75 (0.60-1.01)
Stock Status	Overfished: NO Overfishing: NO	Overfished: NO Overfishing: NO
	Country-specific TACs [Rec. 10-02];	Country-specific TACs [09-03]
Management Measures in Effect:	125/119cm LJFL minimum size	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.

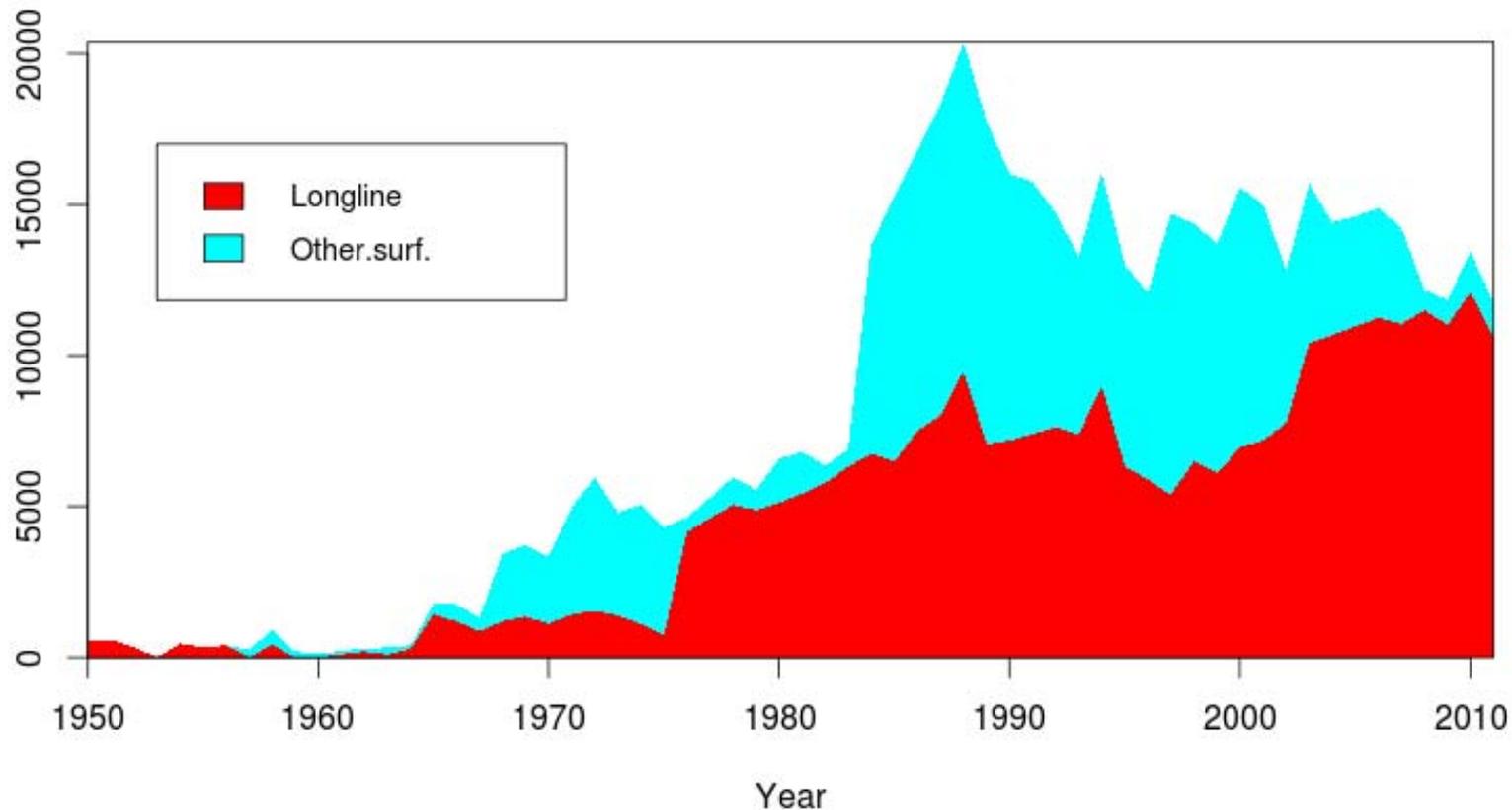
⁴ Provisional and preliminary, based on production model results that included catch data from 1970-2008.

⁵ As of 29 September 2010.



SWO MED Fisheries

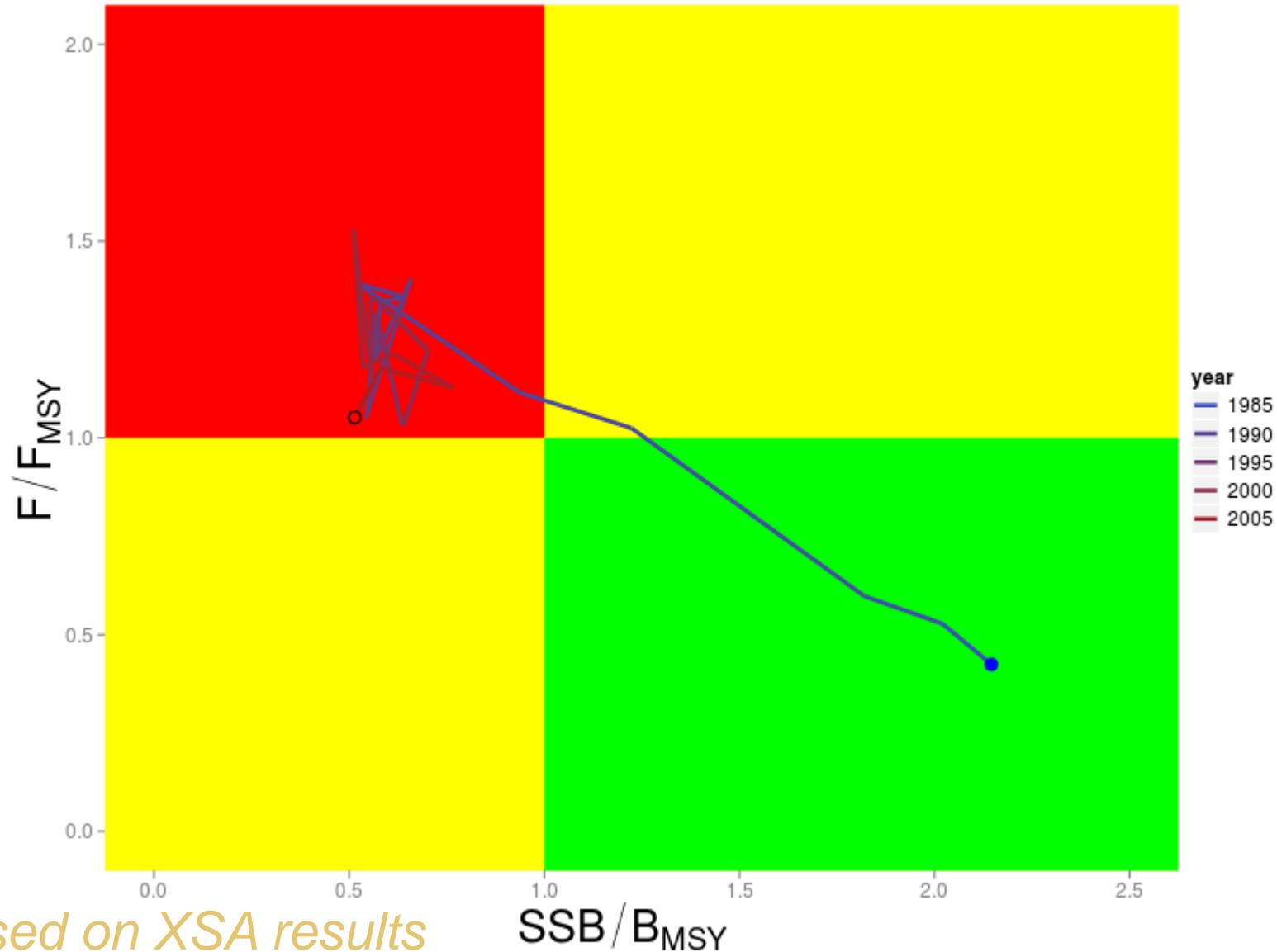
- Main gears: Longlines & surface gillnet (banned in 2012)
- Recent catches around 12,000-16,000 t
- 11,300 t in 2010 (lowest in last 15 years)
- Exploratory work with Turkey to test buoy gear



SWO MED Stock status (2010 assessment)



- Overfished and overfishing



Based on XSA results

SWO MED Summary table



Maximum Sustainable Yield	~14,600
Current (2011, provisional) Yield	11,334 t
Current (2008) Replacement Yield	~12,100 t
Relative Biomass (B_{2008}/B_{MSY})	0.54
Relative Fishing Mortality F_{2008}/F_{MSY}	1.03
Management measures in effect	Driftnet ban [Rec. 03-04], three month closure, gear specifications, size regulations (90 cm LJFL), effort controls through license system [Rec. 11-03]



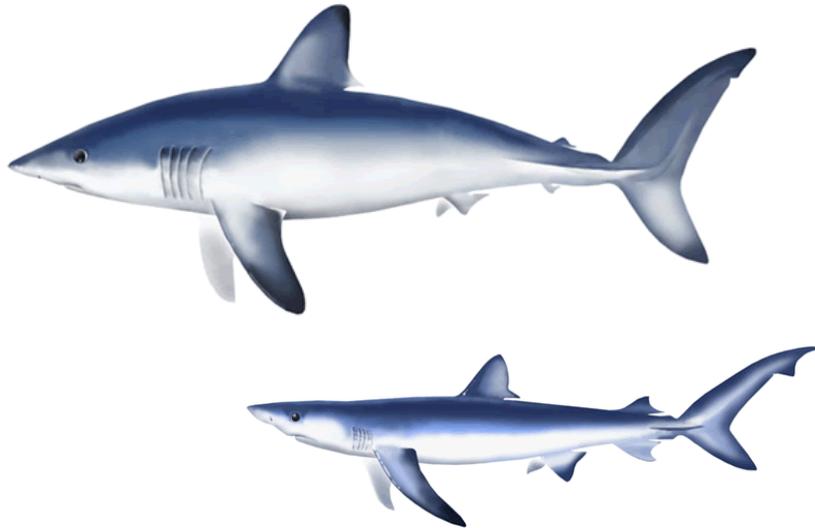
Recommendations

New stock assessment for North and South Atlantic is planned for 2013, entailing two meetings; Data and Methods (Madrid), and the Assessment (Algarve, Portugal).

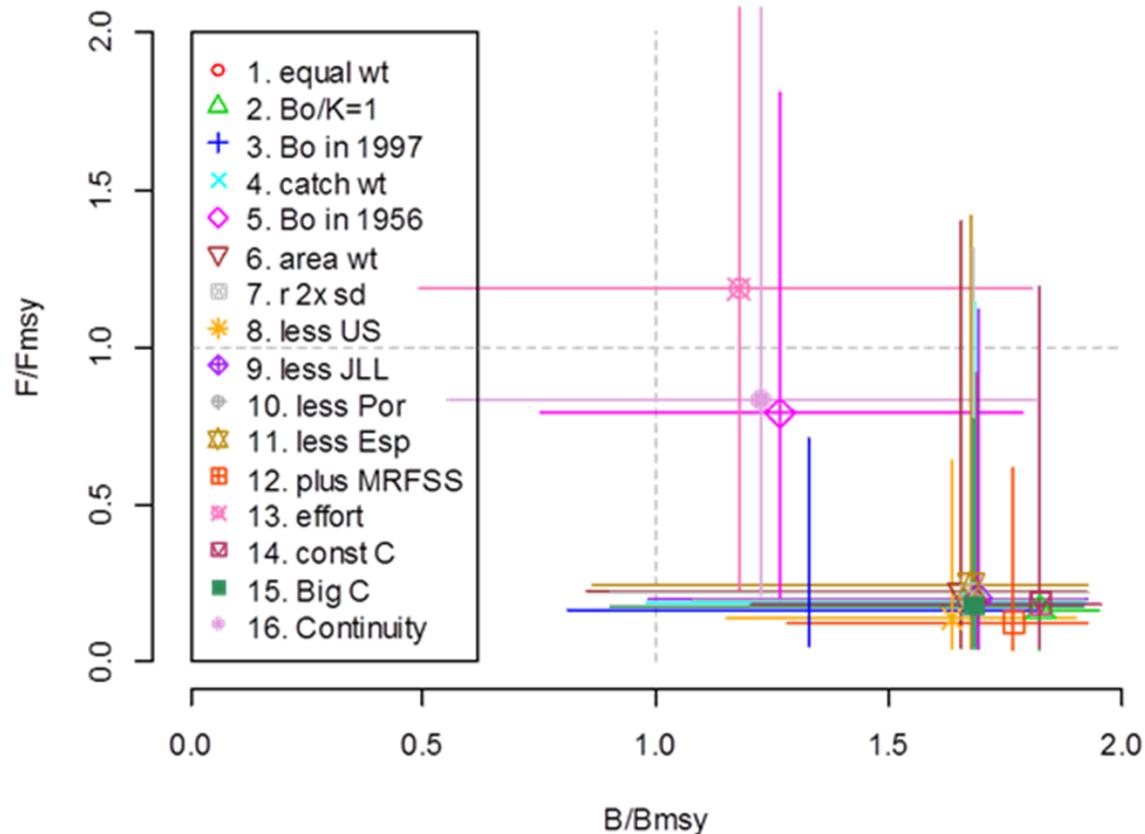
Participation has been waning at SWO meetings. The Group recommends that CPCs that can make valuable contributions to assessments make necessary arrangements to ensure presence of their national scientists at those meetings.



Sharks

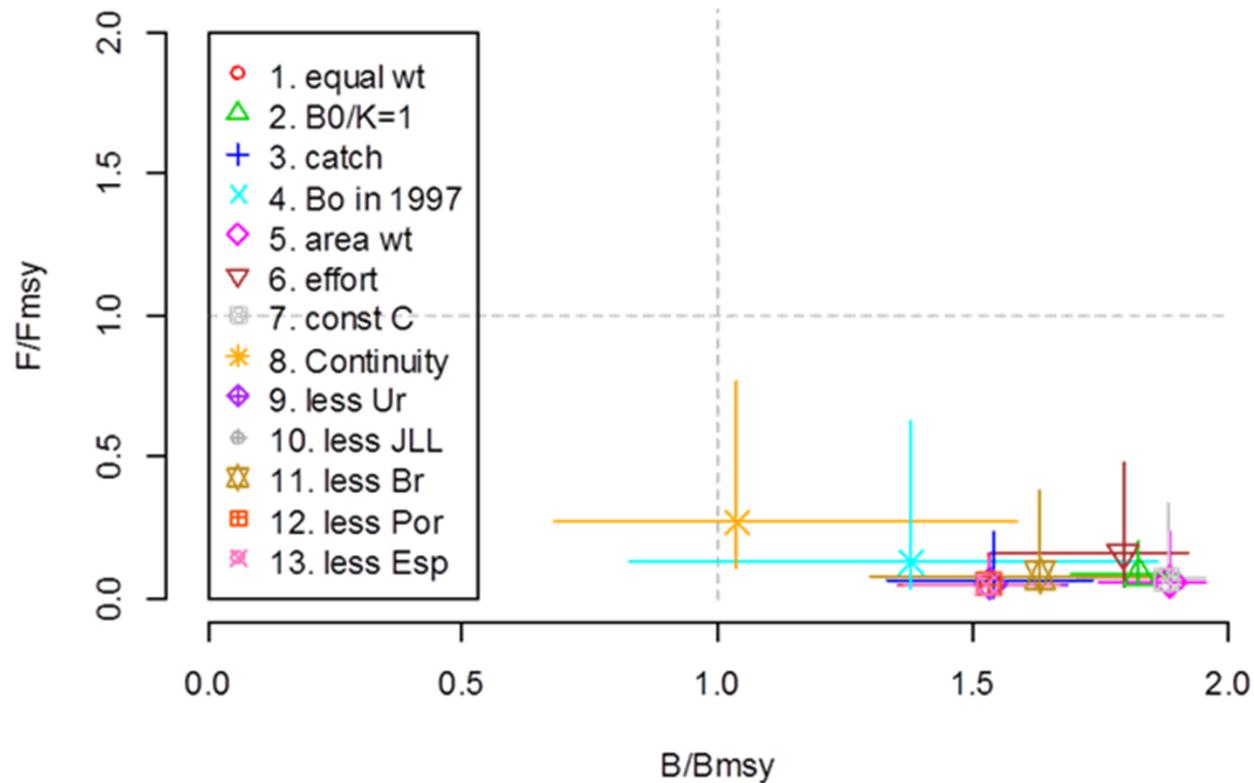


Shortfin Mako Stock Status (NA)



Fifteen out of 16 model runs suggested that current (for 2010) biomass of North Atlantic shortfin mako is above B_{MSY} and fishing mortality rate below F_{MSY} . Bars indicate 80% credibility intervals.

Shortfin Mako Stock Status (SA)



All 13 model runs suggested that current (for 2010) biomass of South Atlantic shortfin mako is above B_{MSY} and fishing mortality rate below F_{MSY} . Bars indicate 80% credibility intervals.

NORTH ATLANTIC SHORTFIN MAKO SUMMARY

Provisional Yield (2011)		2,154 t ¹
Relative Biomass	B_{2010}/B_{MSY}	1,15-2,04 ²
	B_{2010}/B_0	0,55-1,63 ³
Relative Fishing Mortality	F_{MSY}	0,029-0,104 ⁴
	F_{2010}/F_{MSY}	0,16-0,92 ⁵
Overfished 2010 (Y/N)		<u>No</u> ⁶
Overfishing 2010 (Y/N)		<u>No</u> ⁶
Management Measures in Effect:		[Rec. 04-10], [Rec. 07-06],[10-06]

¹ Task I catch.

² Range obtained from BSP and CFASP models. Value from CFASP is SSB/SSB_{MSY} . Low value is lowest value from 16 BSP runs and high value is highest value from 10 CFASP runs.

³ Range obtained from BSP and CFASP models. Value from CFASP is SSB/SSB_0 . Low value is lowest value from 10 CFASP runs and high value is highest value from 16 BSP runs.

⁴ Range obtained from BSP and CFASP models. Low value is lowest value from 16 BSP runs and high value is highest value from 10 CFASP runs.

⁵ Range obtained from BSP and CFASP models. Low value is lowest value from 10 CFASP runs and high value is highest value from 16 BSP runs, with the exception of a single run where the value was 1.63.

⁶ The Committee considers that results have a high degree of uncertainty

SOUTH ATLANTIC SHORTFIN MAKO SUMMARY

Provisional Yield (2011)		1,700 t ¹
Relative Biomass	B_{2010}/B_{MSY}	1,36-2,16 ²
	B_{2010}/B_0	0,72-3,16 ³
Relative Fishing Mortality:	F_{MSY}	0,029-0,041 ⁴
	F_{2010}/F_{MSY}	0,07-0,40 ⁵
Overfished 2010 (Y/N)		<u>No</u> ⁶
Overfishing 2010 (Y/N)		<u>No</u> ⁶
Management Measures in Effect:		[Rec. 04-10], [Rec. 07-06], [REC 10-06]

¹ Task I catch.

² Range obtained from BSP and CFASP models. Value from CFASP is SSB/SSB_{MSY} . Low value is lowest value from 13 BSP runs and high value is highest value from 2 CFASP runs.

³ Range obtained from BSP and CFASP models. Value from CFASP is SSB/SSB_0 . Low value is lowest value from 2 CFASP runs and high value is highest value from 13 BSP runs.

⁴ Range obtained from BSP and CFASP models. Low value is lowest value from 13 BSP runs and high value is highest value from 2 CFASP runs.

⁵ Range obtained from BSP and CFASP models. Low value is lowest value from 13 BSP runs and high value is highest value from 2 CFASP runs.

⁶ The Committee considers that results have a high degree of uncertainty

Vulnerability ranks for 20 stocks of pelagic sharks calculated with three methods: Euclidean distance (v1), multiplicative (v2), and arithmetic mean (v3). A lower rank indicates higher risk. Stocks listed in decreasing risk order according to the sum of the three indices. Red highlight indicates risks scores 1-5; yellow, 6-10; blue, 11-15; and green, 16-20.

Stock	v ₁	v ₂	v ₃
BTH	3	1	1
LMA	5	3	2
SMA	1	8	2
POR	2	7	4
CCS	11	4	5
FAL SA	12	5	6
CCP	15	2	6
OCS	4	13	8
FAL NA	8	11	8
ALV	9	14	11
BSH NA	6	19	10
DUS	17	6	12
SPK	14	10	13
BSH SA	7	20	14
TIG	10	16	15
PLS SA	18	9	16
SPL NA	16	12	16
SPZ	13	17	18
SPL SA	19	15	19
PLS NA	20	18	20

Bigeye thresher, longfin and shortfin makos, porbeagle, and night sharks were the most vulnerable stocks.

SCRS Shark Management Recommendations

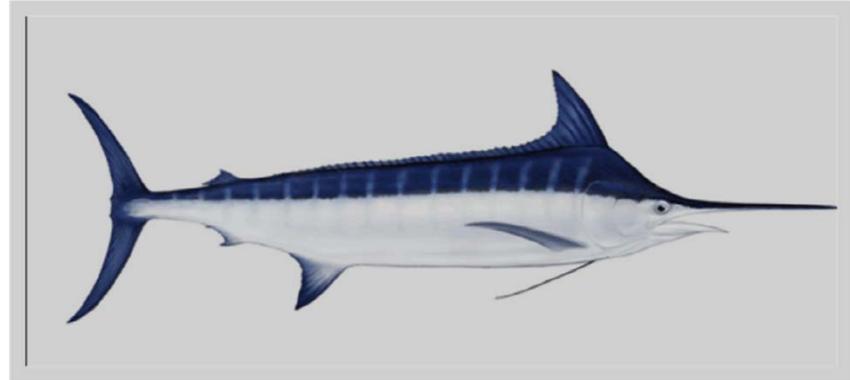
Taking into consideration the continued high vulnerability ranking in the ERA, results from the modeling approaches used in the assessment, the associated uncertainty, and the relatively low productivity of shortfin mako sharks, the committee recommends, as a precautionary approach, that the **fishing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

Considering the need to improve stock assessments of pelagic shark species impacted by ICCAT fisheries, the committee recommends that the **CPCs provide the corresponding statistics of all ICCAT and non-ICCAT fisheries capturing these species, including recreational and artisanal fisheries**. The committee considers that a basic premise for correctly evaluating the status of any stock is to have a solid basis to estimate total removals.

The Committee recommends that the Commission work with countries catching porbeagle, particularly those with targeted fisheries, and relevant RFMOs (e.g., NAFO, CCSBT) to ensure recovery of North Atlantic porbeagle stocks and prevent overexploitation of South Atlantic stocks. In particular, **porbeagle fishing mortality should be kept to levels in line with scientific advice and with catches not exceeding current level. 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 as much as possible among all relevant RFMOs dealing with these stocks, ICCAT should facilitate appropriate communication

The Committee recommends that the commission adopt measures that **allow scientific observers to collect biological samples (vertebrae, tissues, reproductive tracts, stomachs) from species whose retention is prohibited by current regulations and which are already dead at haul-back**. For all of these species, biological knowledge is severely lacking therefore the committee strongly recommended that these samples be collected.

NOAA
FISHERIES
SERVICE

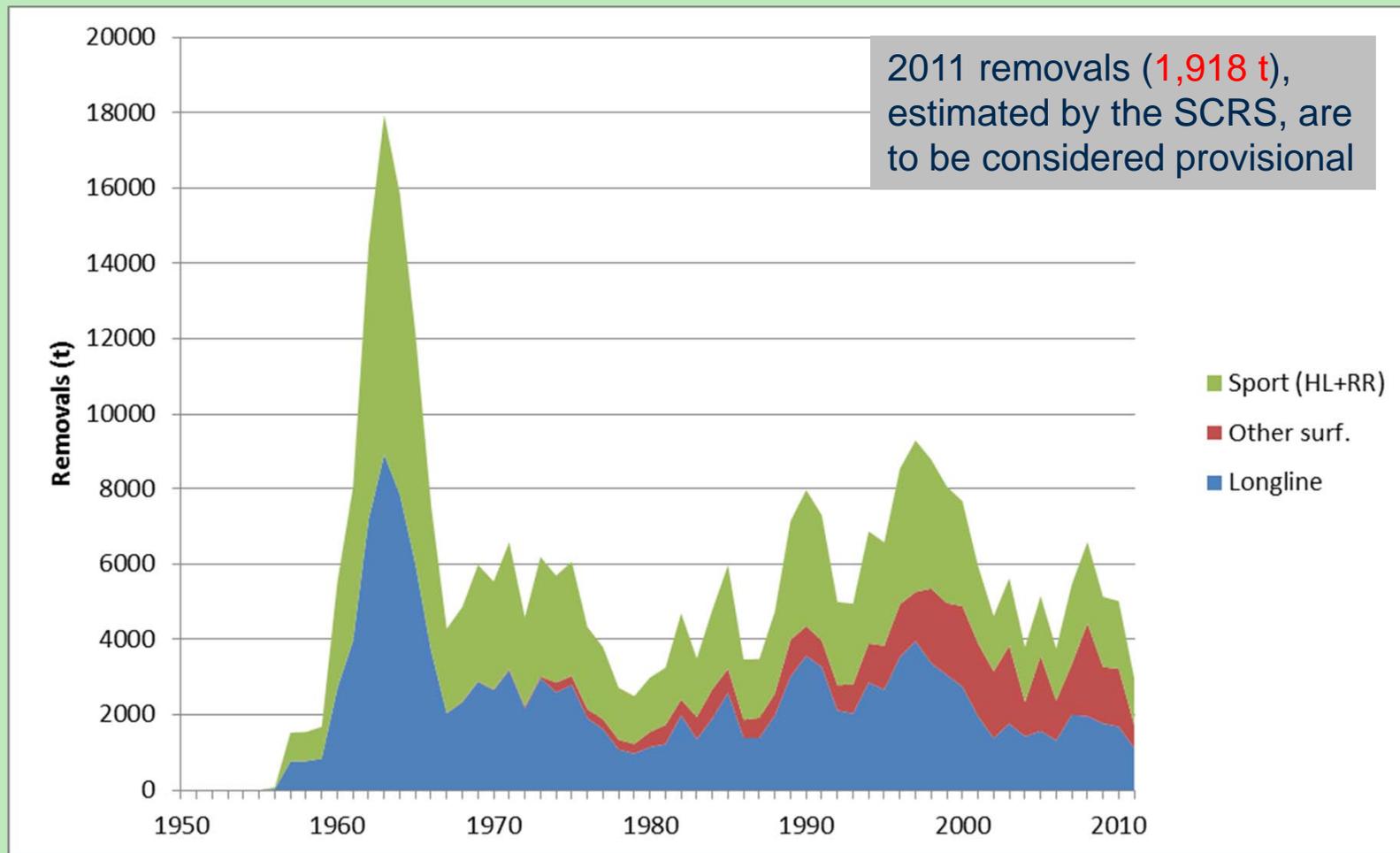


Billfish Working Group



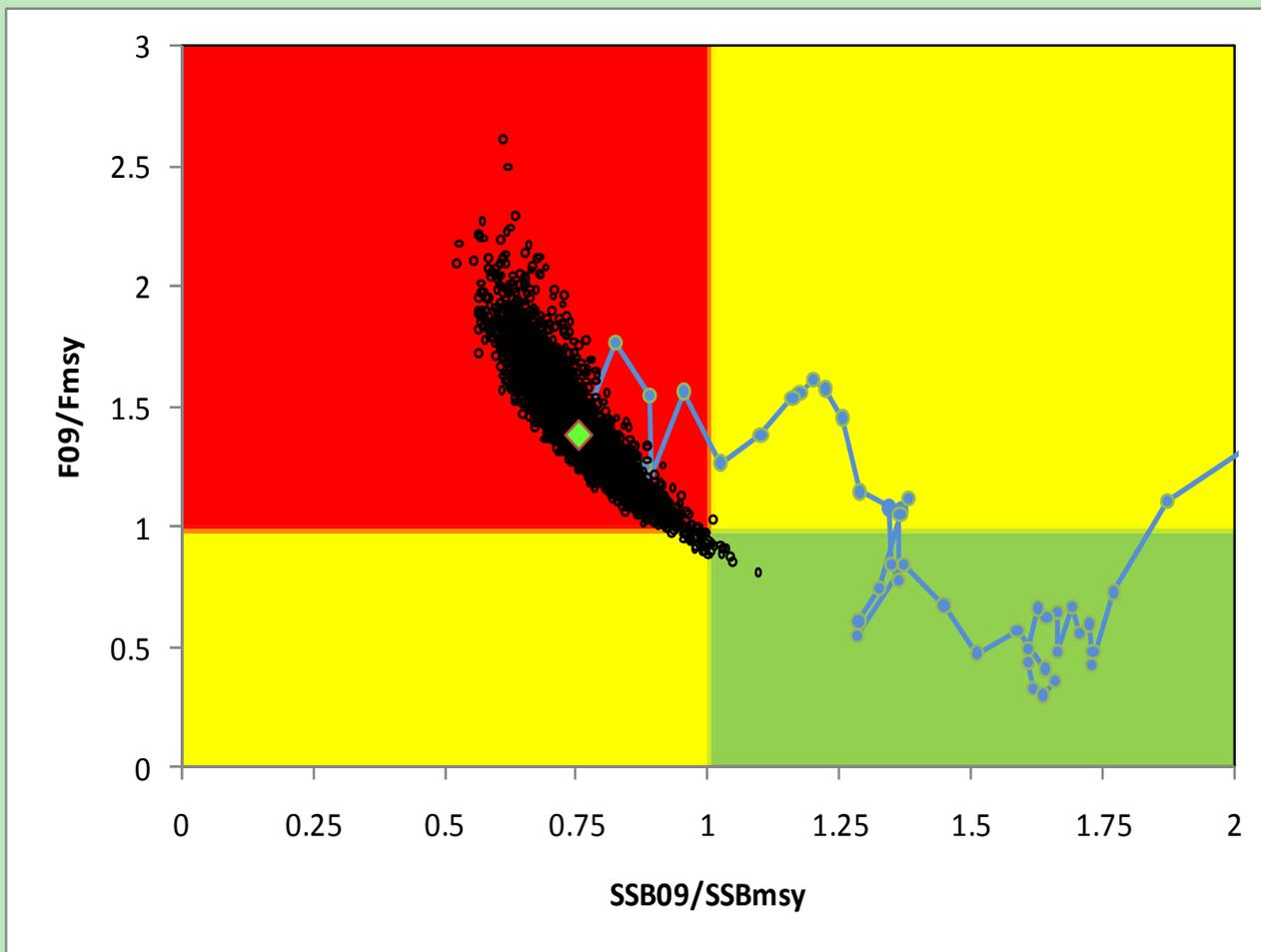
Blue Marlin Landings

North & South



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 (2011) Yield	1,918 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

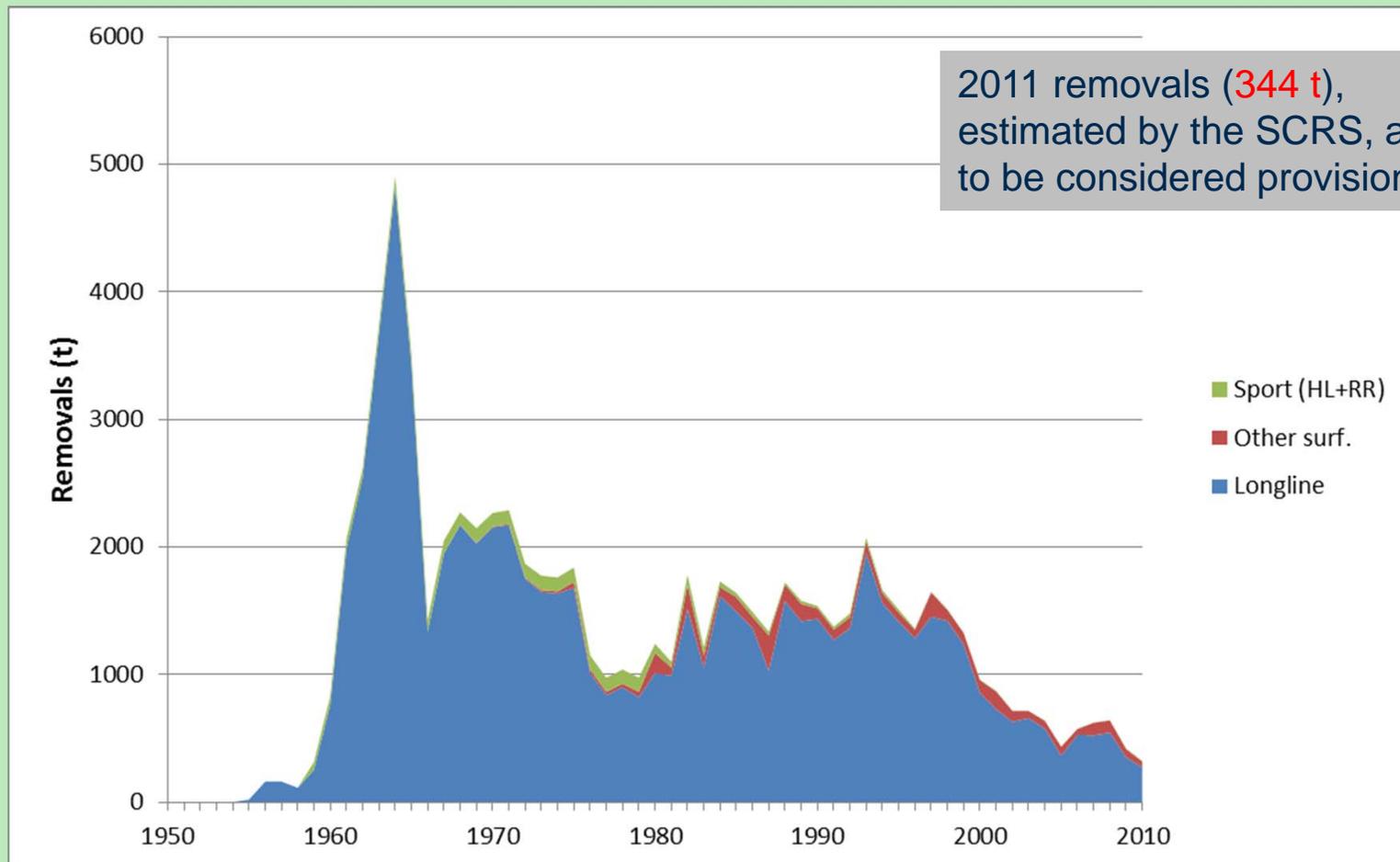
Recommendation [Rec. 06-09].

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

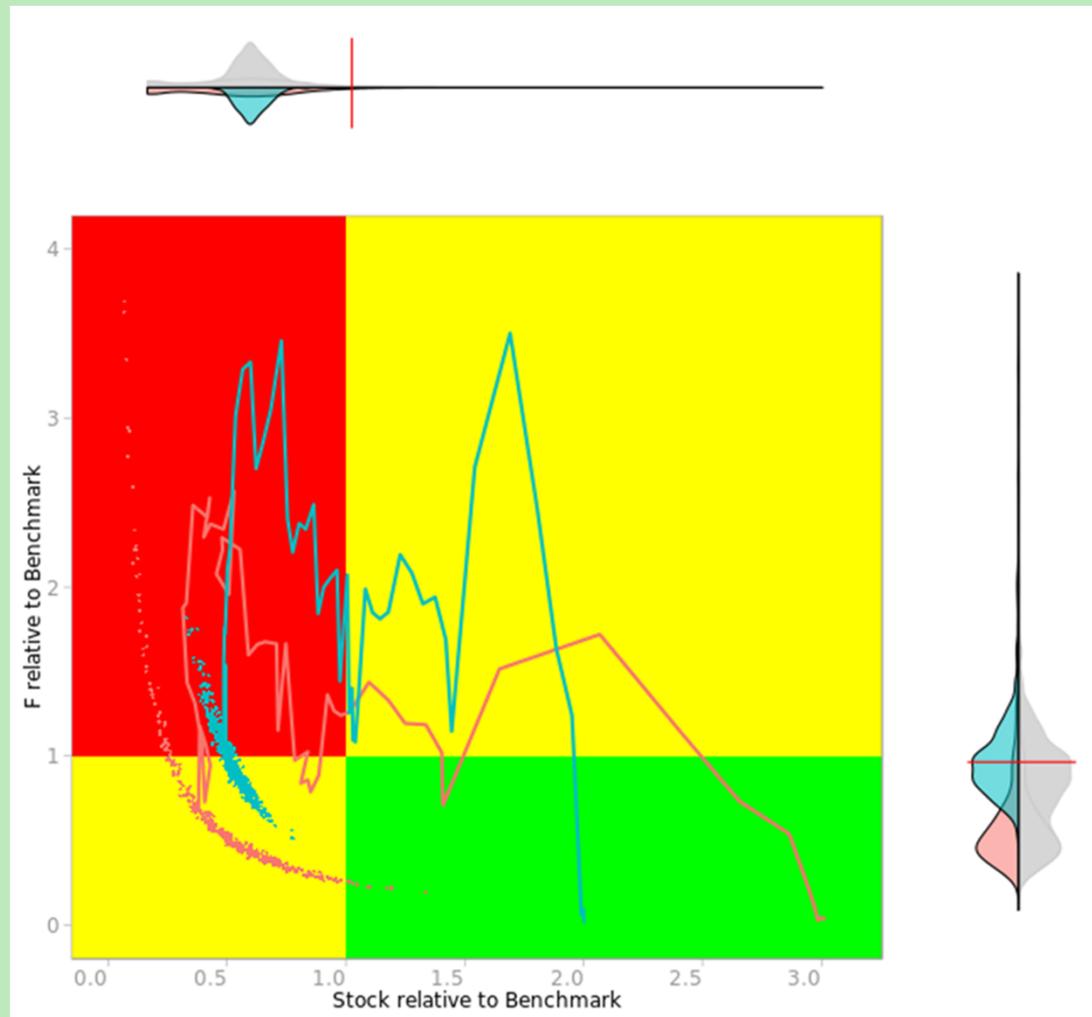
North & South

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.



Current WHM Stock Status

Overfished and undergoing overfishing



White Marlin Summary Table

ATLANTIC WHITE MARLIN SUMMARY

MSY	874 t ¹ - 1604 t ²
Current (2011) Yield	344 t ³
Relative Biomass:	
B ₂₀₁₀ /B _{MSY}	0.50 (0.42-0.60) ⁴
SSB ₂₀₁₀ /SSB _{MSY}	0.322 (0.23-0.41) ⁵
Relative Fishing Mortality:	
F ₂₀₁₀ /F _{MSY}	0.99 (0.75-1.27) ⁴
	0.72 (0.51-0.93) ⁵
⁶ Catch _{recent} /Catch ₁₉₉₆ Longline and Purse seine	0.36
Overfished	Yes
Overfishing	Not likely ⁷

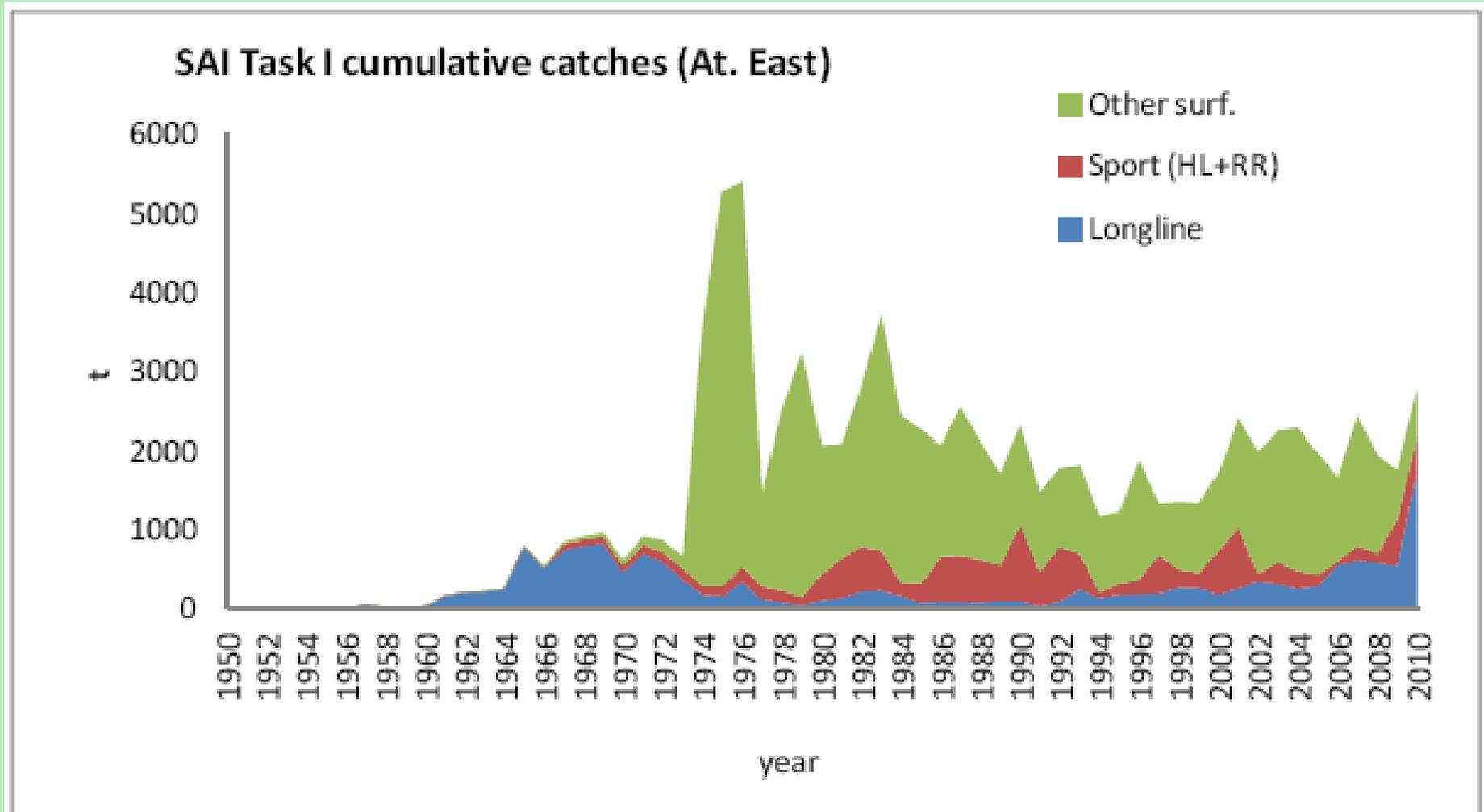
Results of the assessment, and the outlook for the white marlin stock, are highly uncertain due to the undocumented landings and releases of white marlin, the unknown mortality suffered by the released fish, and the lack of certainty on the productivity of the stock.

As a result, forecasts of how the stock will respond to different levels of catch are uncertain. At current catch levels of about 400 t the stock will likely increase in size, but is very unlikely to rebuild to B_{MSY} in the next ten years, while fishing mortality is highly likely to remain below F_{MSY} .

SAI. Fishery indicators

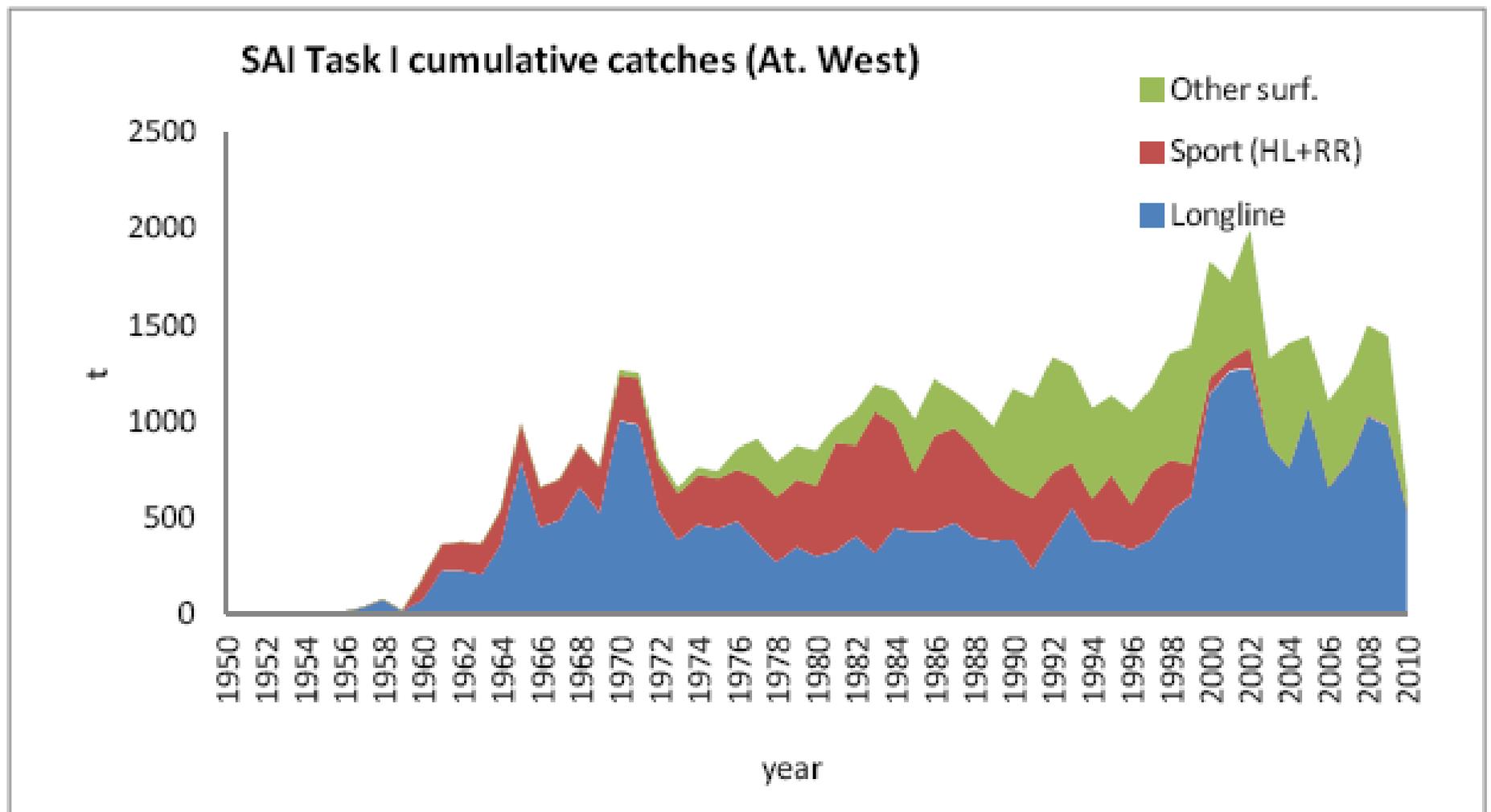
SAI East stock

2011 Yield = 1,057 t



SAI west stock

2011 Yield = 566 t



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
2011 Catches (Provisional)	566 t	1,057 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.



2012 INTER-SESSIONAL
MEETING OF THE
SUB-COMMITTEE ON ECOSYSTEMS

Topics Discussed in 2012

- Interactions of ICCAT fisheries with Sea Turtles
- CPC data Submissions (re: Sea Turtles)
- Impact assessment methodologies
- Sea Turtle bycatch mitigation
- Seabird bycatch mitigation
- Marine mammal/whale shark bycatch
- Bycatch/BPUE estimation
- Ecosystem Based Fisheries Management



Rec. 10-09

5. SCRS shall initiate an assessment of the impact of the incidental catch of sea turtles resulting from ICCAT fisheries as soon as possible and no later than 2013.



CPC Data Submissions - Sea Turtles

Table 14: Summary and characteristics of the CPC data from Fishery Observer (FO) Programs currently at the ICCAT Secretariat to evaluate interactions and impacts of ICCAT fisheries on sea turtle populations. On the fishing gears LL = longline, PS = purse seine and BT = bottom trawl. CPCs are sorted by alphabetical order.

CPC	Gear	Target Species	Time Series	Format	Information provided					Data characteristics
					Date	Coords	Effort	Fate	Source	
Belize										CPC has no reports with sea turtle interactions
Brazil	LL	Not specified	2011	Excel	Yes	Yes	Yes	No	FO	Catches (N) in positive fishing sets
Canada	LL	Swordfish, yellowfin, bigeye tuna	2002/2011	Excel	Yes	Yes	No	Yes	FO	Individual specimen information
China	LL	Bigeye tuna	2010/2011	Excel	Yes	Yes	Yes	Yes	FO	Individual specimen information
China Taipei	LL	Albacore, bigeye tuna	2009/2011	Word	No	No	No	No	FO	Report describing catches (N) and a map with locations
Colombia										No FO program recording sea turtle interactions
EC-France	PS	Tropical tunas	2005/2011	Excel	Yes	Yes	Yes	Yes	FO	Individual specimen information
EC-France	BT	Demersal fishes	2011/2012	Excel	Yes	Yes	Yes	Yes	FO	Individual specimen information
EC-Portugal	LL	Swordfish	2003/2011	Excel	Yes	Yes	Yes	Yes	FO	Catches (N) in positive sets and individual specimen information
EC-Spain	PS	Tropical tunas	2003/2007	PDF	No	No	No	No	FO	SCRS and ALR docs reporting data from purse seines (EC.ESP and EC.FRA)
Egypt										CPC reports that no significant interactions with ICCAT fisheries occur
Iceland										CPC reports that no significant interactions with ICCAT fisheries occur
Japan	LL	Not specified	2010	Excel	Yes	No	No	Yes	FO	Individual specimen information
Korea	LL	Not specified	2011/2012	Excel	Yes	Yes	No	Yes	FO	Individual specimen information
Lybia	LL	Bluefin tuna	2006	Excel	Yes	Yes	No	Yes	FO	Individual specimen information
Mexico	LL	Yellowfin tuna	1993/2010	Excel	Yes	Yes	No	Yes	FO	Individual specimen information
South Africa	LL	Bigeye, yellowfin tuna	2002/2011	Excel	Yes	Yes	No	Yes	FO	Individual specimen information
Tunisia										List of species recorded
US	LL	Not specified	1999/2011	Excel	Yes	No	Yes	Yes	FO	Bycatch and individual specimen information

2013 Work Plan

Assessment of sea turtle bycatch in ICCAT fisheries

- ERA/PSA Analysis
- Quantification of incidental catch in ICCAT fisheries and non-ICCAT fisheries

Progress toward ecosystem based fisheries management approaches in ICCAT fisheries.

Proposed Bycatch Data Form

Bycatch database will include the elements summarized below
(Kobe Process, JBTWG)

Aggregated data is acceptable (e.g. as per CPCs data confidentiality requirements)

Fields included on will vary depending on the level of aggregation, gear, and species chosen

CPCs may submit raw observer program data, and aggregation scheme to Secretariat

Categorisation of data submitted	Vessel information	Trip information	Fishing Activity	Harvest details	Biological information	Tagging
<ul style="list-style-type: none"> - Aggregated data - Disaggregated - Bycatch species only - All species 	For disaggregated data submissions <ul style="list-style-type: none"> - Vessel identifiers - Vessel characteristics - Equipment 	Information will vary according to level of aggregation <ul style="list-style-type: none"> - Flag states - Areas fished - Dates - Effort information (fishing days, hooks etc.) - Observer information 	<ul style="list-style-type: none"> - Vessel - General Gear - Dates - Positions For disaggregated <ul style="list-style-type: none"> - Detailed gear info - Haul and set identifiers 	<ul style="list-style-type: none"> - Target species catches (if applicable) by number or weight - Discard dead - Discard alive - Bycatch by species or main grouping by number or weight 	<ul style="list-style-type: none"> - Species - Lengths - Weights - Units of length and weight - Condition 	<ul style="list-style-type: none"> - Haul/set/trip - Date - Species - Length - Weight - Location

ICCAT MEETINGS 2013

	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	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		
																ICCAT-ICES MSE*																			
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				
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	
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			
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	
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		
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		
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
Oct			30	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	
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			

* Provisional dates for the course

SCRS meetings