



COM 2015

## Panel 1

- Background on the tropical tuna fishery
- BET Bigeye tuna (assessed in 2015) (\*)
- SKJ Skipjack (assessed in 2014)
- YFT Yellowfin tuna (assessed in 2011)
- Responses to COM Requests
- Recommendations
- Work Plan

(\*) [SCI-032, SCI-033] Reports of the 2015 ICCAT bigeye tuna meetings

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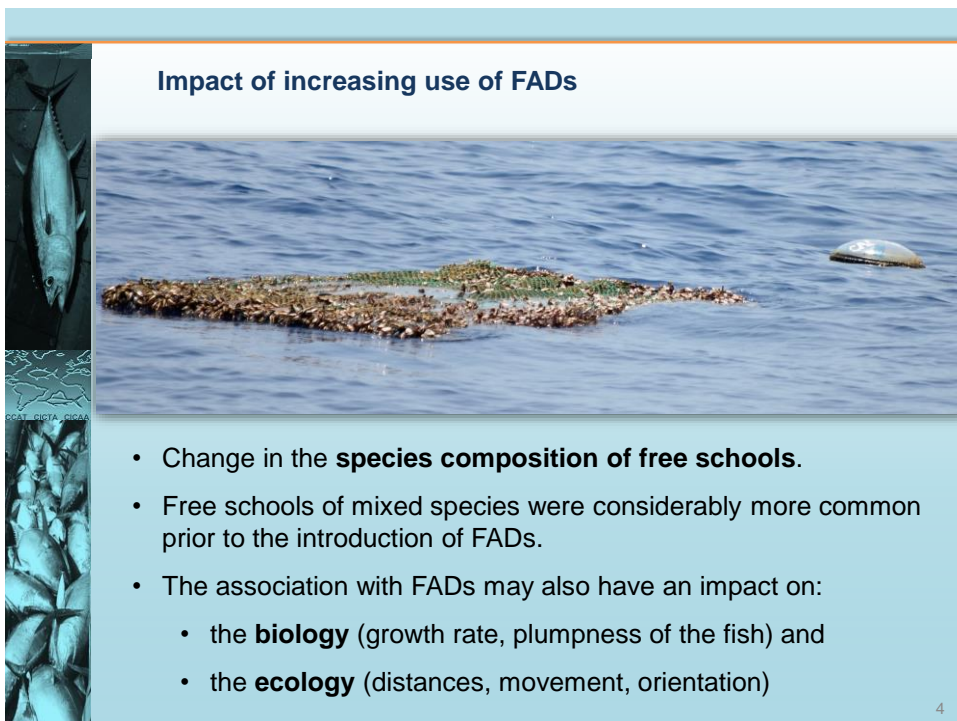
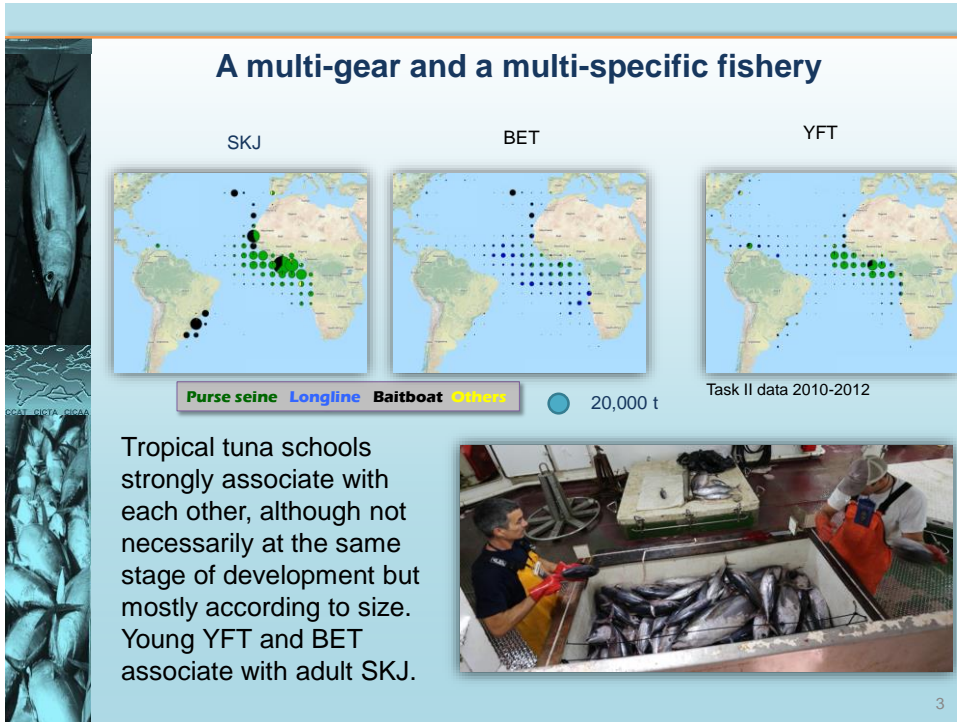


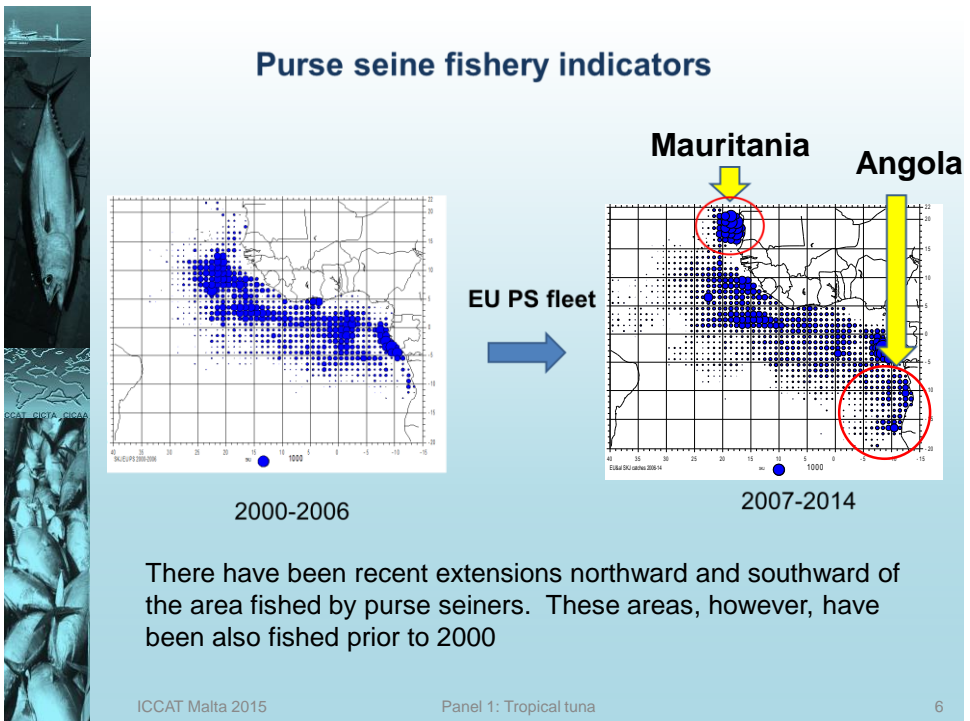
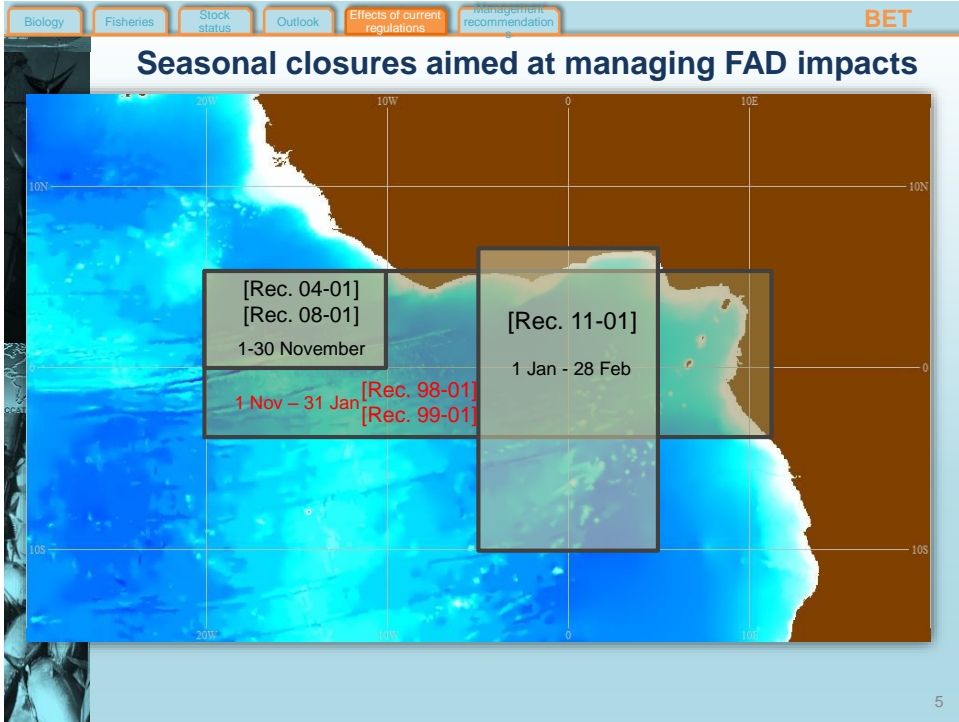
COM 2015

## This year's work

- **Assessment of BET** stock
- **Update** of recent and some **historical catches**
- **Update** of **CPUE indices** and other fishery indicators
- Contributions to FAD working group
- Completion of development of a **tropical tuna tagging program** to support assessment of stock status
- Continued development of on-board **automated monitoring** of PS catches
- Next assessment planned: [YFT-2016]


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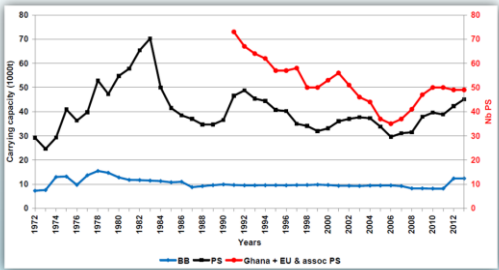
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## Purse seine fishery indicators



### Nominal fishing effort

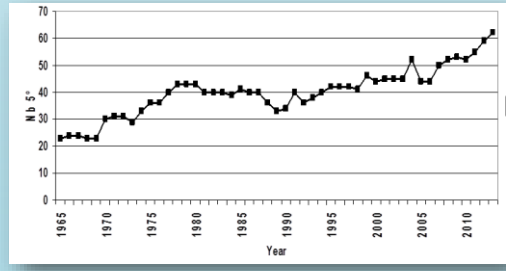
- Nominal carrying capacity [PS-BB]
- Number of PS






### Total surface fished

Number of 5° squares fished yearly in the entire Atlantic by all fleets (CATDIS file) with a yearly SKJ catch >10 t.

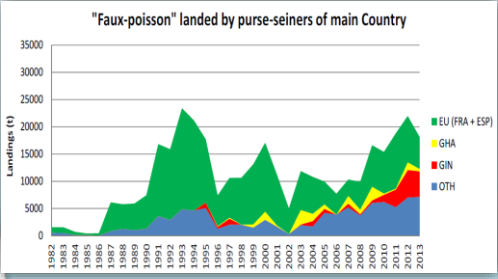


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## Estimate of tropical tuna landed as “faux-poisson” in the local market of Abidjan in Côte d’Ivoire



### “Faux-poisson” landed by purse-seiners of main Country



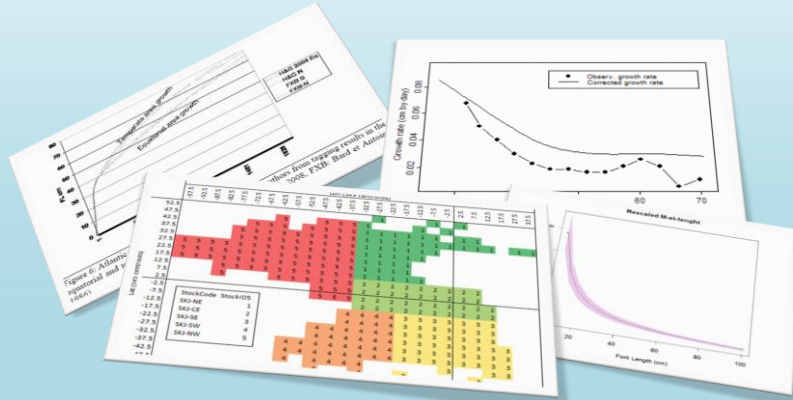
- Around 6,600 t/year [1988-2007, EU and associated PS].
- Around 10,500 t/year [2005- 2013, all PS in the eastern Atlantic]
- SKJ represents around 30% of the total “faux-poisson”.
- The Committee regularly integrates these estimates in the **reported historical catches** for the EU-purse seiners since 1982, as well as in the catch-at-size matrix.

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## Biological parameters

There is a **high degree of uncertainty on biological parameters** needed to conduct accurate stock assessments:

- Stock structure and movements.
- Growth (VB vs two-stanza); differences by sex
- Natural mortality



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## Atlantic tropical tagging program [AOTTP]

- A **multi-species, multi-annual, large-scale** tropical tuna tagging program is now in place thanks to funding of EU and other CPCs that have started to contribute to it.
- Simultaneously tag the 3 main species (YFT, SKJ, BET) as well as small-tunas:
- The AOTTP will provide critical data to **reduce uncertainty** in stock status determination for the three species.
- ICCAT has now hired the AOTTP coordinator and soon more staff will be hired to be able to meet the program's calendar.



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## AOTTP

For the program to achieve its objectives we **will need the COOPERATION of all CPCs and stakeholders involved in this fishery:**

- Matching funding
- Research access to coastal countries' EEZ
- Research access to coastal countries' territorial waters to fish for bait
- Cooperation of CPCs and fishers in recoveries activities
- Access to logbook data to retrieve date/position of recoveries Be willing to engage in capacity building activities

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YFT




## BIGEYE TUNA

Last  
assessment:  
2015




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BET




Single stock




## BIGEYE (*Thunnus obesus*)

Bigeye tuna, Patudo, Thon obèse	
<b>Scientific name</b>	<i>Thunnus obesus</i>
<b>Distribution</b>	Widely distributed in the tropical and subtropical waters of the Atlantic. Geographical limits are 55°-60°N and 45°-50°S.
<b>Spawning grounds</b>	Spawning takes place throughout the entire year in a vast zone in the vicinity of the equator with temperatures above 24°C from the coast of Brazil to the Gulf of Guinea. primer trimestre en mayoría y zona limitada entre 5°S y 10°S
<b>Maturity</b>	Around 100-110 cm - 3 year old
<b>Life span</b>	Around 15 years
<b>Maximum size</b>	Around 200 cm
<b>Natural mortality</b>	Assumed to be 0.8 for ages 0 and 1, and 0.4 for ages 2+

2010



→

2015



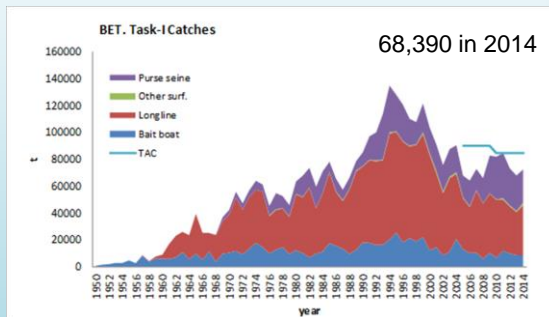
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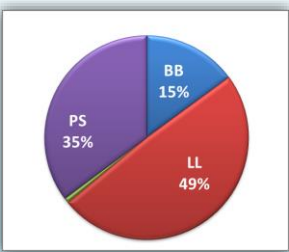


Atlantic bigeye tuna represents around 18% of the world production (average 2009-2013).

BET Catches by main gear type



68,390 in 2014



% average catch in 2009-2013

- Historic high of about 133,000 t in 1994.
- After 1994, all major fisheries exhibited a decline of catch

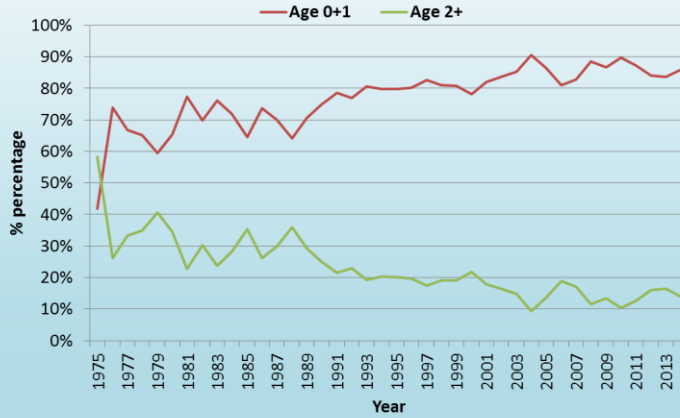
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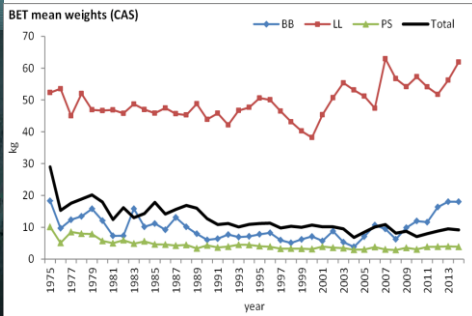
CAA: The proportion of the Age 0 and 1 fish in the total catch began to increase over time and in 2014 represented 86% of the catch in numbers and 26% in weight.



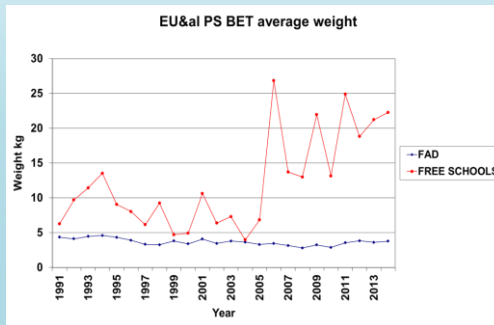
ICCAT Malta 2015

Panel 1: Tropical tuna

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Average fish weight differs between gears: heaviest fish caught by LL



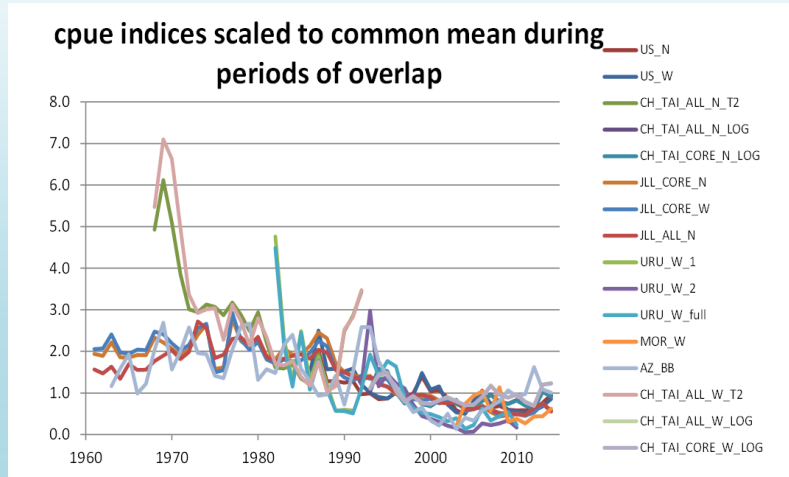
ICCAT Malta 2015

Panel 1: Tropical tuna

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## RELATIVE ABUNDANCE BASED ON CPUE INDICES



### Assessment Models to perform

ASPIC: Non-equilibrium production model

SS3: Statistical age-structured model.

VPA: Virtual Population Analysis

Three types of populations models were used in the 2015 assessment

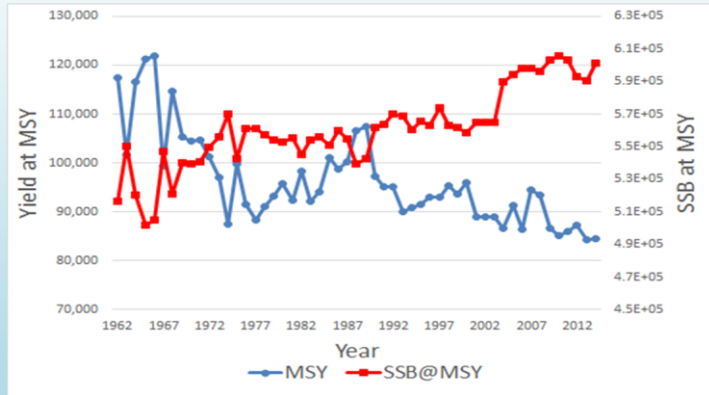
... but two only were used to produce the advice

These two models were given equal weight in determining the state of the stock.





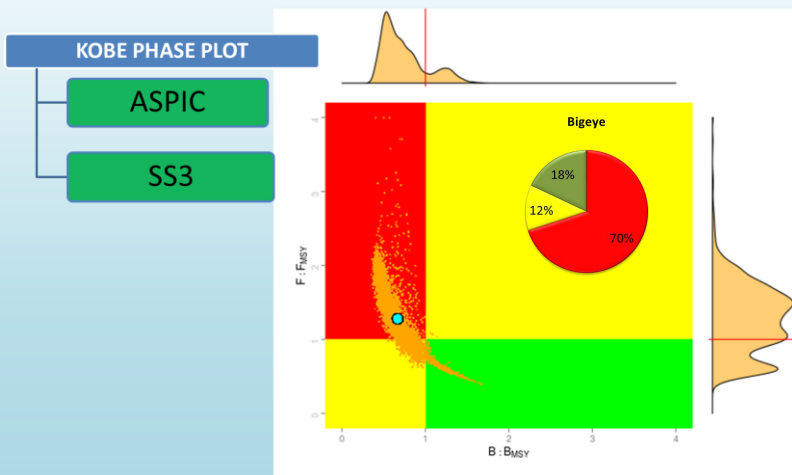
**SS3: Statistical age-structured model**



since the early 1990,  
 MSY estimates have declined  
 The Spawning stock biomass required to produce MSY  
 has increased



**STATUS OF BET AS OF 2014 BASED ON COMBINATION OF MODEL RESULTS**





- ✓ Catch 2014 ~ 72,585 t
- ✓ Average catch 2010-201 ~ 76,141 t
- ✓ MSY = 78,824 t. (67,725 – 85,009 t)
- ✓  $B_{2014}/B_{MSY} \sim 0.67 (0.48-1.20)$
- ✓  $F_{2012}/F_{MSY} \sim 1.28 (0.62-1.85)$

OUTLOOK

Probability of being in the green zone ( $B > B_{msy}$  and  $F < F_{msy}$ )

TAC (000 t)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
0	17	17	21	33	57	74	85	92	95	97	98	99	99	99
40	17	17	18	22	31	40	51	60	67	73	78	81	84	87
45	17	17	18	21	29	37	45	53	60	66	71	76	79	81
50	17	17	18	20	27	34	41	48	53	59	64	69	72	76
55	17	17	18	20	25	31	37	42	47	51	56	60	64	68
60	17	17	17	19	23	28	33	37	40	44	48	52	55	58
65	17	17	17	18	22	26	30	33	36	39	42	44	46	49
70	17	17	17	18	21	24	26	30	31	34	36	38	39	41
75	17	17	17	18	19	22	24	26	27	29	31	32	33	35
80	17	16	16	16	18	19	21	22	23	25	26	27	28	29
85	17	16	16	16	18	18	20	21	21	22	25	24	26	29
90	17	15	15	15	16	16	17	19	19	19	19	18	18	19
95	17	14	14	13	13	12	12	12	12	11	10	10	10	8
100	17	12	11	10	8	7	6	6	5	4	6	5	4	3

Current TAC 85,000 t

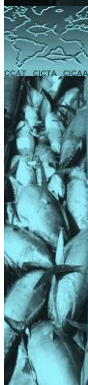
Low probabilities that it will be in the green zone before 2028

EFFECTS OF CURRENT REGULATIONS



Estimates of reported catch for 2002-2014 (**BET-Table 1**) have been always lower than 85,000 t with the exception 2011 landings were close to theTAC. Note, however, that catches for 2012-2014 are still under revision. Current TAC levels did not result in the stock achieving levels consisted with the Convention Objectives. .

Concern over the catch of small bigeye tuna partially led to the establishment of spatial closures to surface fishing gear in the Gulf of Guinea [Recs. 04-01, 08-01 and 11-01]. These closures has been mostly ineffective in reducing the mortality enough to prevent the deterioration of stock status estimated by the SCRS.






## MANAGEMENT RECOMMENDATIONS


- The Committee recommends the Commission to reduce the TAC to a level that would allow the recovery of the stock with high probability and in as short period as possible in accordance with the principles of Recommendation 11-13.
- Should the Commission wish to increase long-term sustainable yield, the Committee continues to recommend that effective measures be found to reduce fishing mortality of small bigeye tunas, including the mortality caused by fishing on FADs and from other sources.

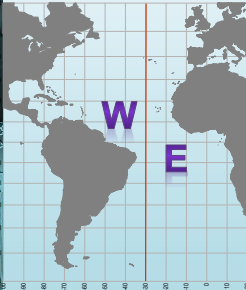
## SKIPJACK 2015



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W  
E


Two stocks

## ASSESSED in 2014

Skipjack, Listado, Listao	
<b>Scientific name</b>	<i>Katsuwonus pelamis</i>
<b>Distribution</b>	Gregarious species that is found in tropical, subtropical, and warm temperate waters
<b>Spawning grounds</b>	Breed opportunistically throughout the year over wide areas of the Atlantic
<b>Maturity</b>	Depending on the areas, between 42 and 50 cm
<b>Life span</b>	Around 5 years
<b>Maximum size</b>	Around 100 cm (18 kg)
<b>Natural mortality</b>	M vector decreasing with size (Gaertner, 2014)

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## SCRS catalogue on SKJ statistics (Task-I and Task-II)

Species	Stock	Region	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100
SKJ	ATL	CF	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100

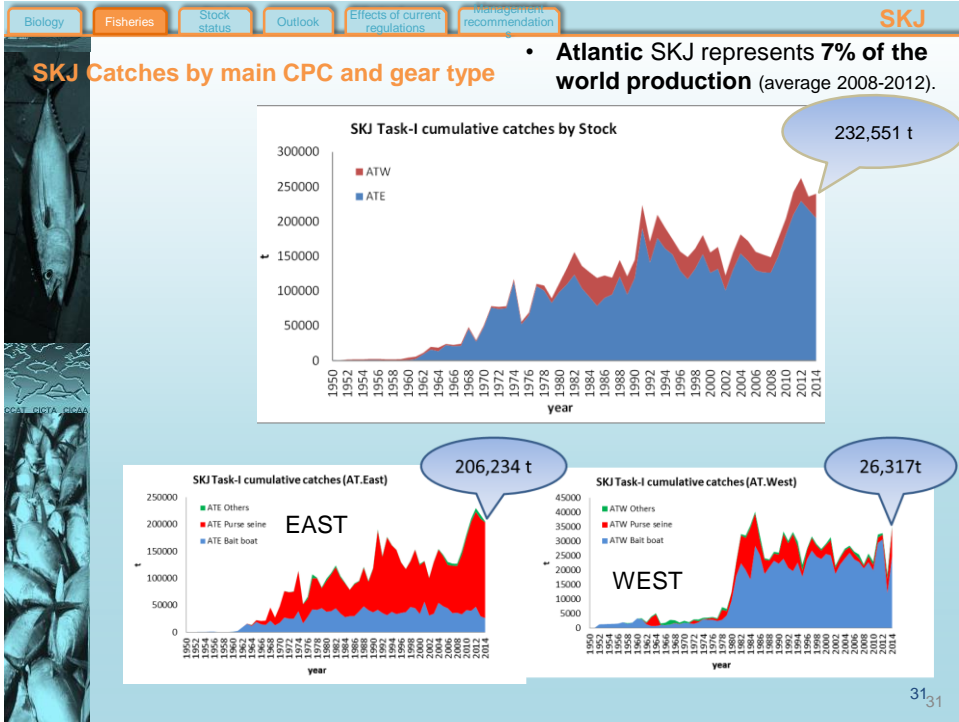
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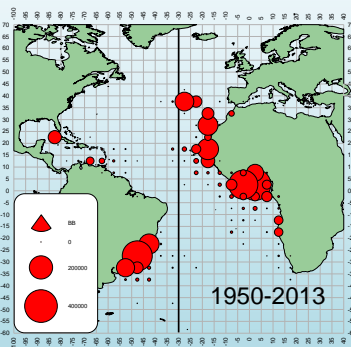
Many improvements in the quantity and quality of data available for assessment for the recent period

a	no T2 data
b	t2ce only
c	t2st only
bc	cas only
ab	t2st + cas
ac	t2ce + t2st
abc	all

30<sub>30</sub>

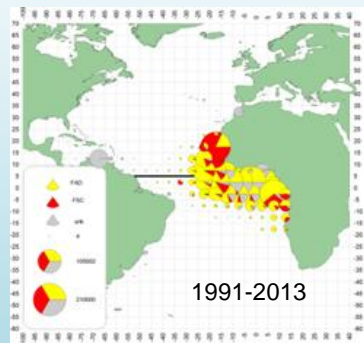


BAITBOAT

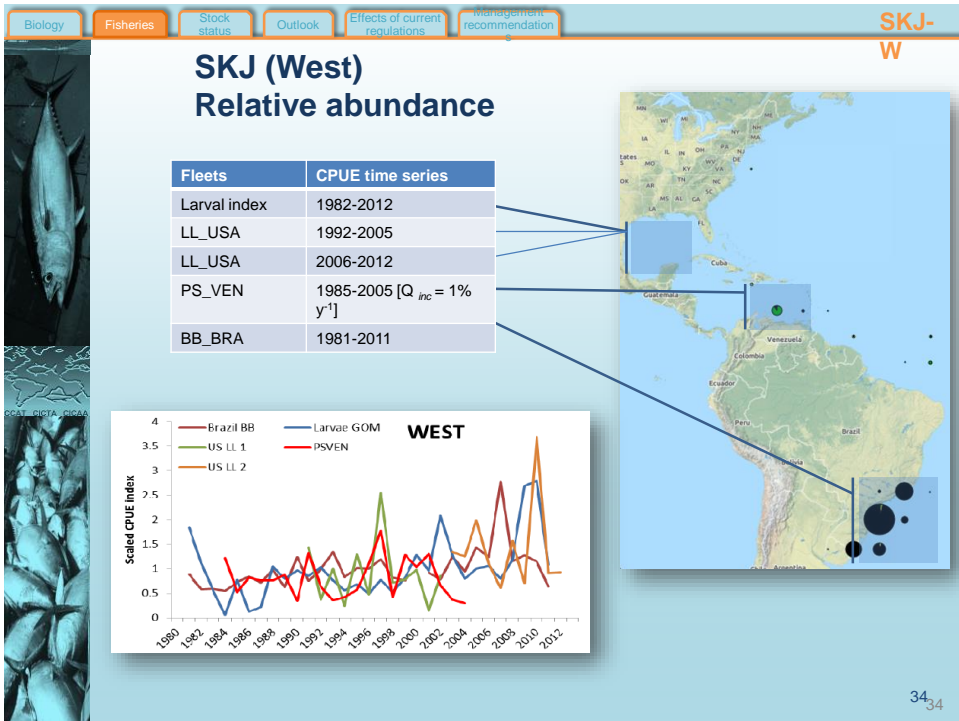
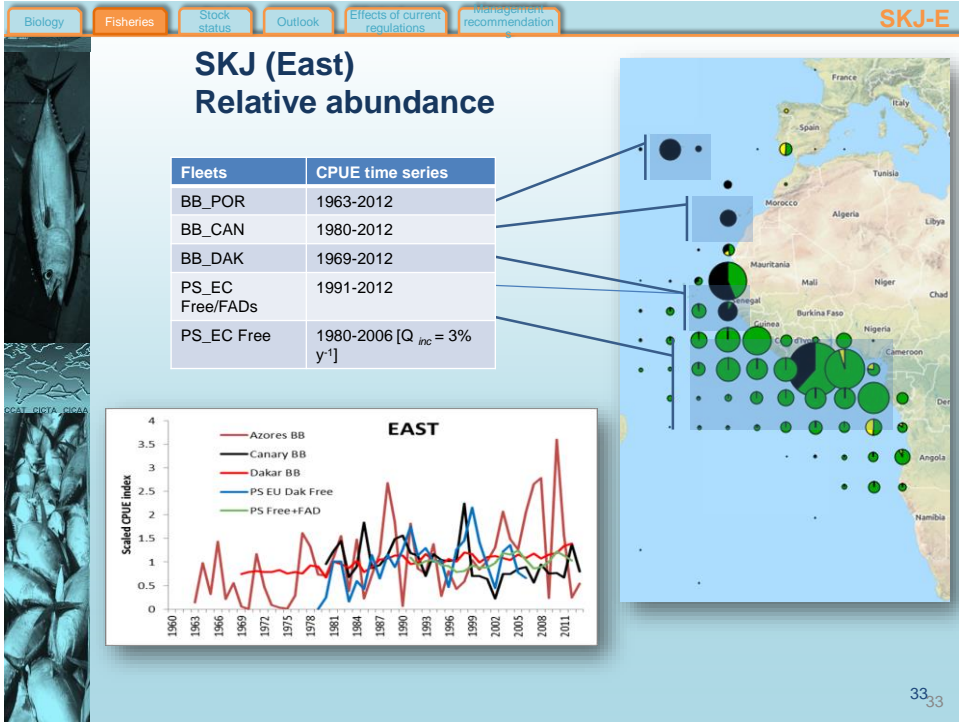


Baitboat fishery has a wide distribution in both sides of the Atlantic

PURSE SEINE



Purse seine catches are more recent and mostly made in the Eastern Atlantic. A high proportion come from fishing on FADs



Biology Fisheries **Stock status** Outlook Effects of current regulations Management recommendation SKJ - E

### Stock status (East Atlantic)

Traditional stock assessment models were unable to provide estimates of management benchmarks with the available data

**No evidence** however (e.g., decrease in CPUE or in mean weight) that Eastern SKJ **be overfished**

<b>Current Catch (2014)</b>	<b>206,091 t</b>
Average catches 2009-2014	<b>208,501 t</b>

Current Replacement Yield	Unknown
Relative Biomass ( $B_{2013}/B_{MSY}$ )	Likely >1
Mortality due to fishing ( $F_{2013}/F_{MSY}$ )	Likely <1

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Biology Fisheries **Stock status** Outlook Effects of current regulations Management recommendation SKJ - W

### Stock status (West Atlantic)

**NO Overfishing, Not overfished**

**MSY: 30,000 – 32,000 t**

Current Catch (2014)	<b>26,317 t</b>
Average catches (2009-2014)	<b>28,744 t</b>

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Biology Fisheries Stock status Outlook Effects of current regulations Management recommendation SKJ

## Management recommendations

- Despite the **absence of evidence that the eastern stock is overexploited**, but considering
  - the lack of quantitative findings for the eastern stock assessment,
  - pending the submission of additional data (FADs and Tagging Program),

the Committee recommends that the **catch and effort levels do not exceed the level of catch in recent years.**
- Increasing harvests and fishing effort for SKJ could lead to involuntary consequences for other species that are caught in combination with SKJ in certain fisheries.
- For the West Atlantic, the Committee has not formulated any management recommendation, and has only indicated that the **catches should not be allowed to exceed the MSY.**

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## Effects of current regulations on skipjack



- There is currently **no specific regulation** in effect for skipjack tuna.
- Several **time/area regulatory measures** on banning fishing on FADs [Rec. 98-01] and [Rec. 99-01] or on complete closure to surface fleets [Rec. 04-01] have however been implemented in the East Atlantic. Their intended aim was to **protect YFT and BET juveniles**, however, they can possibly affect the stock of SKJ because SKJ is the main target of the fleet when they fish on FADs.

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Biology Fisheries Stock status Outlook Effects of current regulations Management recommendation YFT




# YELLOWFIN TUNA

Last assessment: 2011

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Biology Fisheries Stock status Outlook Effects of current regulations Management recommendation YFT

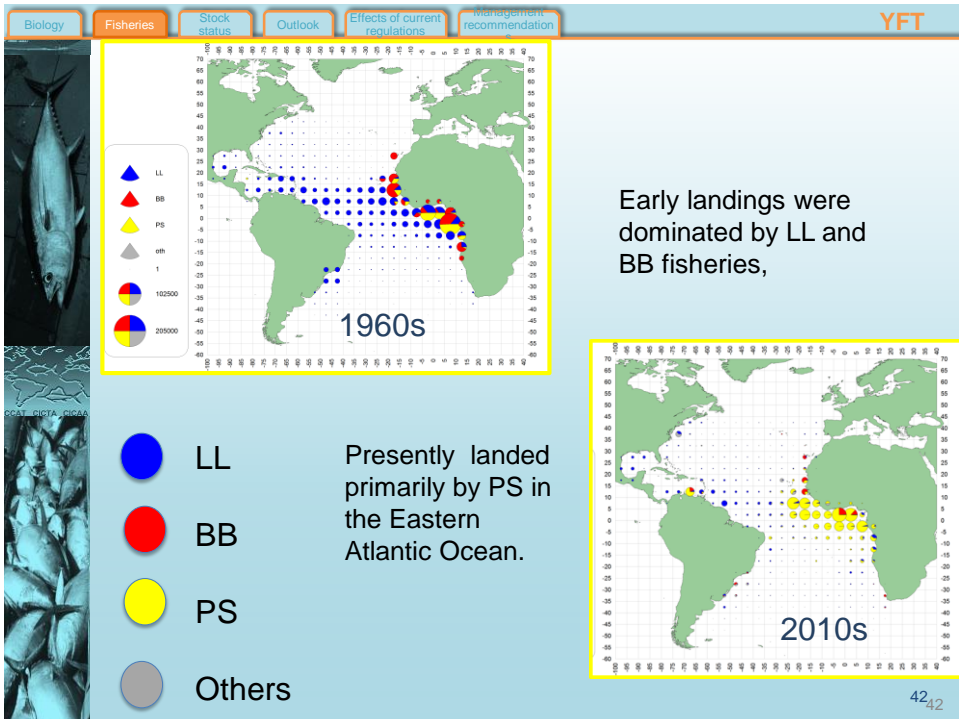
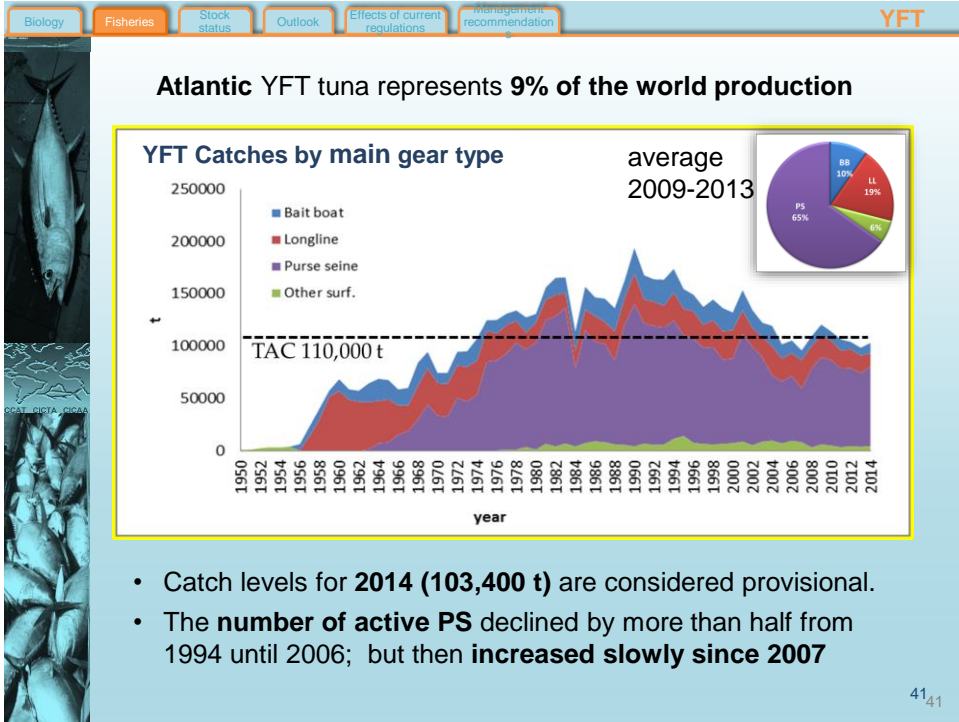




Single Atlantic stock

Yellowfin, Rabil, Albacore	
Scientific name	<i>Thunnus albacares</i>
Distribution	Tropical and subtropical species distributed mainly in the epipelagic oceanic waters
Spawning grounds	The main spawning ground is the equatorial zone of the Gulf of Guinea (January to April). Spawning also occurs in the Gulf of Mexico, in the southeastern Caribbean Sea, and off Cape Verde, although the relative importance of these spawning grounds is unknown
Maturity	Around 100 cm - 3 year old
Life span	Around 10 years
Maximum size	Around 230 cm (180 kg)
Natural mortality	Assumed to be 0.8 for ages 0 and 1, and 0.6 for ages 2+

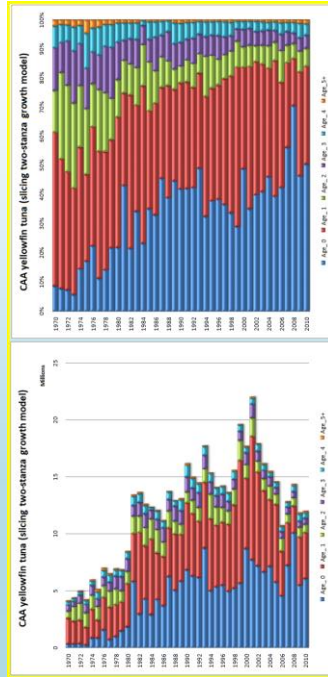
Uncertainties in both natural mortality and growth have **important implications for stock assessment**. **Younger age classes exhibit a strong association with FADs**. This association increases the vulnerability of these smaller fish.

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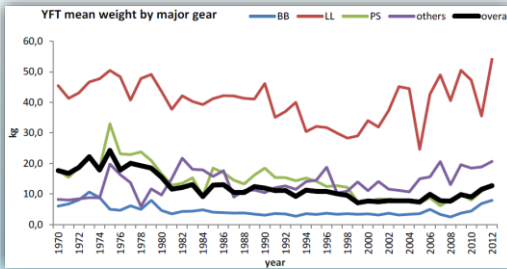
Shift toward purse seine (and FADs) has resulted in landing a higher proportion of age 0 and 1 landed (shift in selectivity).



Age (years)

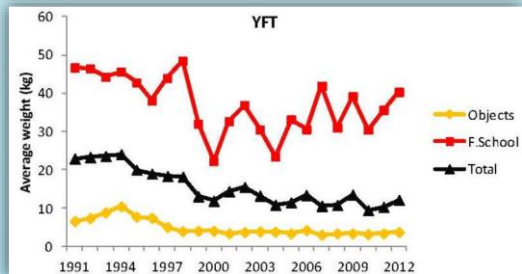


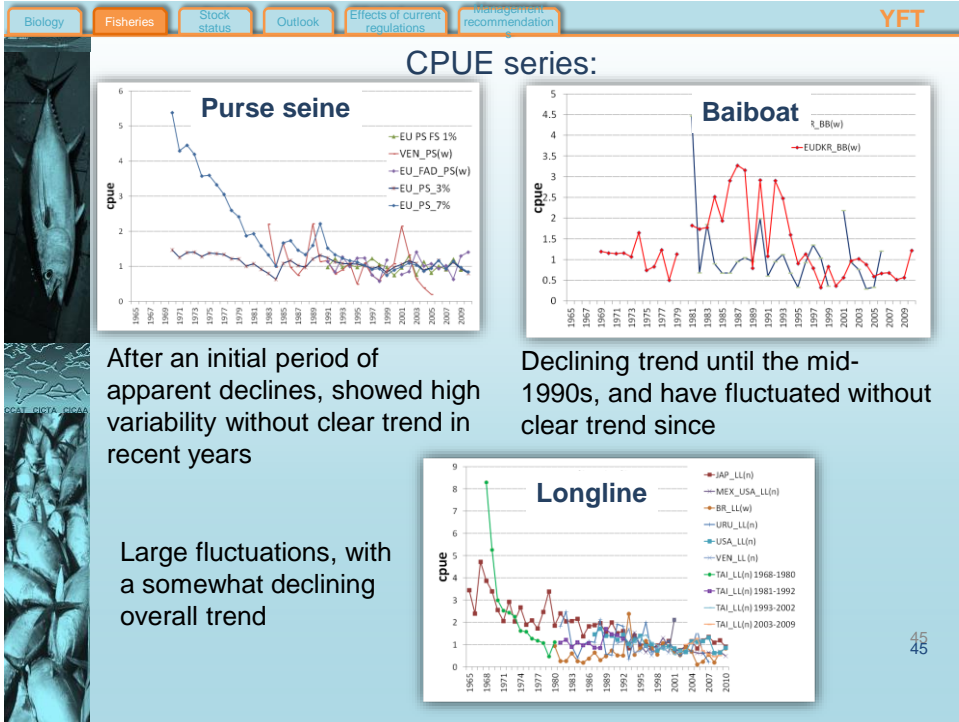
### Average weight of yellowfin tuna by fishing gear



Average YFT weight differs between major gears. The recent average weight in EU PS catches has declined to about half of the average weight of 1990 (at least in part due to changes in selectivity associated with fishing on FADs beginning in the 1990s).

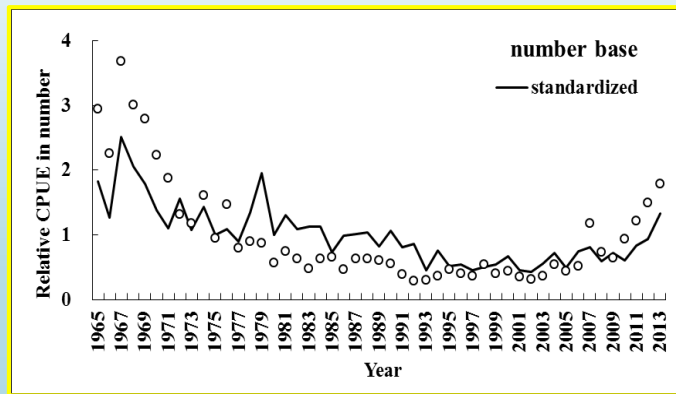
Trend in YFT average weight for EU PS separated between free schools and FAD associated.





One updated recent index (SCRS/2014/081)

The Japanese longline index was updated through 2013, and suggests some increase in catch rates in the most recent years.





Biology Fisheries Stock status Outlook Effects of current regulations Management recommendation YFT

## Catch at age: 1970-2010

This **evolution in selectivity** has implications for how much yield can be taken from the stock while maintaining (or rebuilding) it at a level consistent with the Convention Objective.

MSY Relative to MSY 2010

144,600 in 2010

10% to 35% higher in 1970s

MSY / MSY2010

YEAR

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Biology Fisheries Stock status Outlook Effects of current regulations Management recommendation YFT

## Stock status

MSY = 144,600 t (114,200-155,100 t)  
 2013 Yield = 92,615 t  
 $B_{2010}/B_{MSY} = 0.85$  (0.61-1.12)  
 $F_{current}/F_{MSY} = 0.87$  (0.68-1.40)

- There is considerable **uncertainty** in the assessment of stock status and productivity for yellowfin tuna.
- 26% of the outcomes indicate the stock is **consistent with the Convention Objective**.

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Biology Fisheries Stock status Outlook Effects of current regulations Management recommendation YFT

## Outlook

TAC	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
50,000	25%	51%	70%	78%	84%	87%	89%	91%	92%	93%	94%	95%	95%	96%
60,000	24%	48%	66%	76%	81%	85%	87%	89%	90%	92%	93%	93%	94%	94%
70,000	24%	45%	63%	73%	78%	82%	85%	87%	89%	90%	90%	92%	92%	93%
80,000	24%	43%	59%	69%	75%	79%	82%	84%	86%	87%	88%	89%	90%	90%
90,000	24%	40%	54%	65%	71%	75%	78%	81%	82%	84%	85%	86%	87%	88%
100,000	24%	37%	49%	59%	66%	70%	73%	76%	78%	80%	81%	82%	83%	84%
110,000	23%	35%	45%	53%	59%	64%	67%	70%	72%	74%	75%	76%	77%	78%
120,000	23%	32%	40%	46%	51%	55%	58%	61%	64%	65%	66%	68%	69%	70%
130,000	23%	29%	35%	39%	43%	45%	47%	49%	51%	53%	54%	55%	56%	58%
140,000	22%	26%	29%	31%	33%	34%	36%	36%	37%	38%	39%	39%	40%	40%
150,000	20%	21%	22%	22%	22%	21%	21%	21%	21%	21%	21%	21%	20%	20%

LANDINGS TAC

- Maintaining current TAC= 110,000 t [Rec. 11-01] is expected to lead to a biomass somewhat above  $B_{MSY}$  by 2016 with a 60% probability.
- Reported catches for 2011-2013 are lower than the corresponding TAC.

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Biology Fisheries Stock status Outlook Effects of current regulations Management recommendation YFT

## Effects of current regulations

- Spatial closures** to surface fishing gear in the Gulf of Guinea [Recs. 98-01, 99-01, 04-01, 08-01, **11-01**].
- Rec. 11-01 also implemented a **TAC of 110,000 t** for 2012 and subsequent years.
- In 1993, the Commission recommended “that there be no increase in the level of effective fishing effort exerted on Atlantic YFT, over the level observed in 1992”. **Effective effort in 2010 appeared to be near the 1992 levels.**

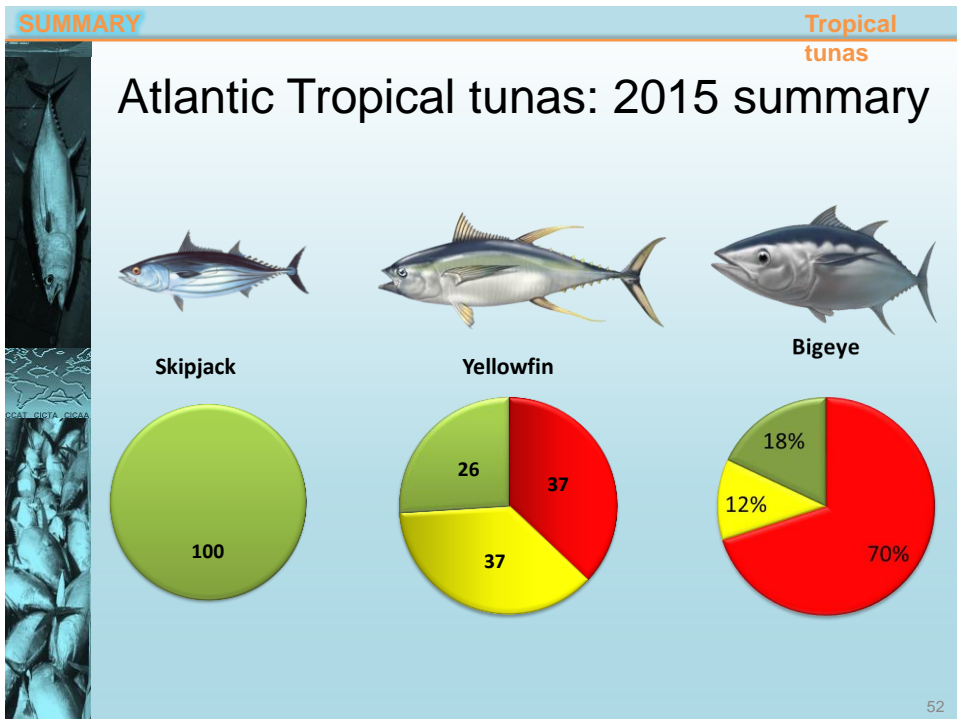
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Biology Fisheries Stock status Outlook Effects of current regulations Management recommendations YFT

## Management recommendations

- Atlantic YFT stock was estimated to be overfished in 2010. Continuation of **catch levels of 110,000 t** (TAC) or below (as seen in the last three years) are expected to lead to a 60 % probability that the biomass will be above  $B_{MSY}$  by 2016
- The Committee continues to recommend that if the Commission wanted to increase long term sustainable yield they could do it by **effective measures that can reduce fishing mortality on small/young YFT, such as that produced by fishing on FADs**
- The Committee recommends that an assessment be conducted in 2016 to:**
  - Confirm predicted recovery of stock biomass and appropriateness of current TAC
  - Evaluate the effect of recent increases in purse seine effort and of past seasonal closures

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## RESPONSES TO THE COMMISSION

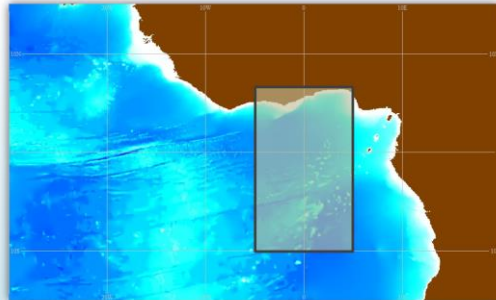
19.1 Evaluate the efficacy of the area/time closure referred to in paragraph 24 for the reduction of catches of juvenile bigeye and yellowfin, [Rec. 14-01] paragraph 26

19.2 Evaluate the potential impact on the level of catches of the detailed capacity management plan submitted by Ghana, [Rec. 14-01] paragraph 2

No specific response on tropical tunas from the SCRS

### 19.1

SCRS was requested to evaluate recommendation 14-01 established an area/time closure in relation with the protection of juveniles.

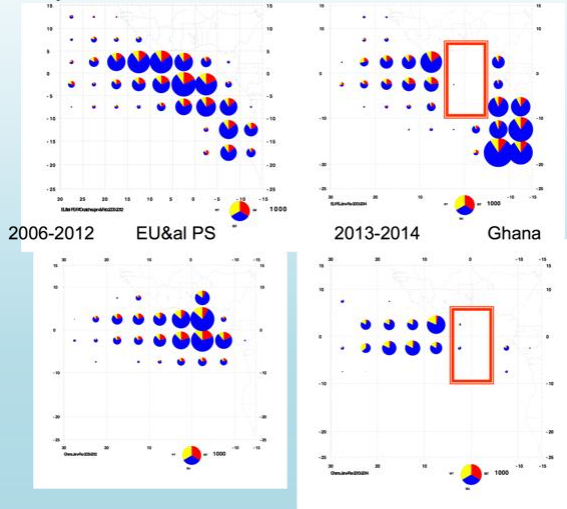


Specifically the SCRS was asked to evaluate the efficacy of the area/time closure referred in reducing catches of juvenile bigeye, yellowfin and skipjack tunas

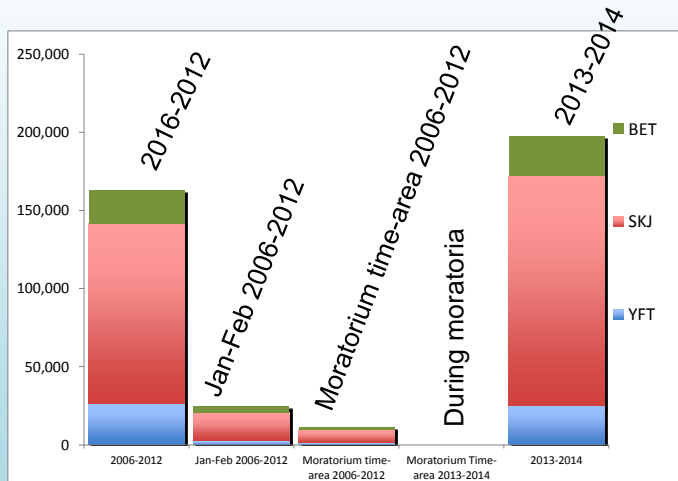
SCRS response is in section 19.1 of PLE 104/215



SCRS examined the fine-scale skipjack, yellowfin, and bigeye catch by month distributions from the European and Associated purse seine fleet FAD fishery and the Ghanaian purse seine and baitboat fishery



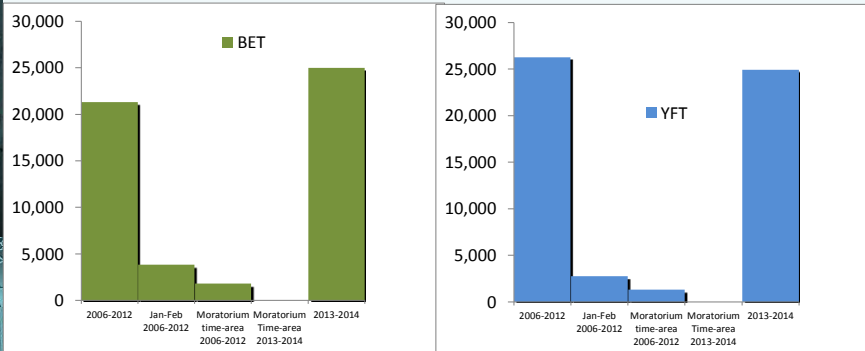
### Average Annual Catch



Though the moratorium was well respected by the main fishing fleets (EU/Associated fleet and Ghana), no reductions in tropical tuna catch were seen



No reductions in catch were seen either for BET nor for YFT



Reasons for this lack of effect:

Higher proportions of bigeye in the catch are observed offshore, compared to more coastal, and thus a closure that is further offshore, larger, and for a longer period is likely to have a greater effect than the current closure, however the SCRS has not evaluated such effect.

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## 19.2

Rec. 14-01, which replaced Rec. 11-01, established a new bigeye capacity allocation plan for CPCs whose vessels (>20m LOA) participate in the yellowfin and bigeye fisheries. The capacity allocation table in Rec. 14-01 reduced the number of purse seiners for Ghana from the currently authorized 17 to 13.

SCRS was asked to evaluate the potential impact of the Ghanaian allocation on the level of bigeye catches.

SCRS notes that:

The theoretical reduction under the specific assumptions made by the SCRS would be a 24% reduction in capacity. If vessels that leave the fishery are less efficient than those that remain the reduction will be smaller. But the SCRS cannot estimate how much smaller. Also any such reduction in capacity will not necessarily lead to a reduction in bigeye catches because not all fleets are reduced in capacity and fleets continue to increase fishing power

SCRS response is in section 19.2 of PLE 104/215

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## Tropical Tuna Working group work plan

1. The Working Group proposes to conduct an assessment of Yellowfin in 2016
2. The group envisages will continue studies into the reproductive biology of YFT to support the assessment
3. The Group will in 2016 explore the prospects for developing Management Strategy Evaluation (MSE) frameworks for Atlantic Bigeye.
4. The working group will continue to support the work of the Adhoc working group on FADs
5. Provide support to the AOTTP