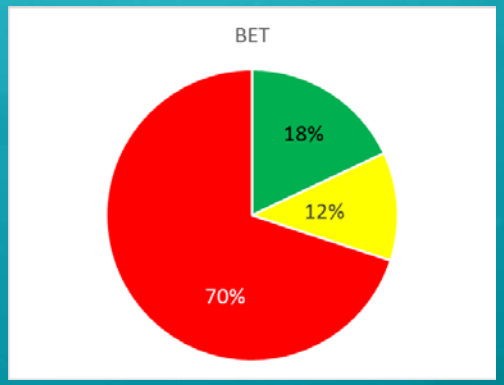
ICCAT SCRS Report (PLE-104)
Panel 1- Tropical tunas

ICCAT Stock Status Report card 2017 Tropical tunas

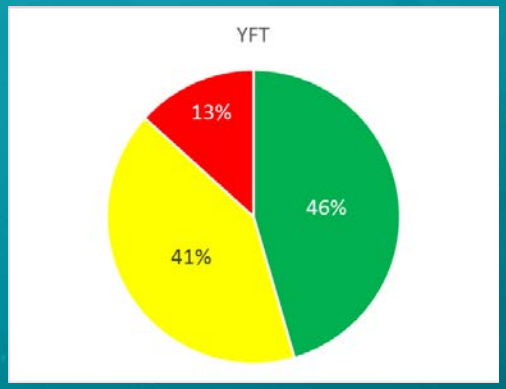
3 species, 4 stocks inhabiting similar areas, caught together by same gears – but with different stock status

Stock in 2014



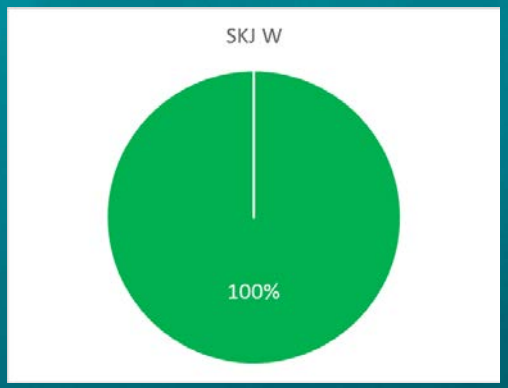
BET (2015)

Stock in 2014



YFT(2016)

Stock in 2013



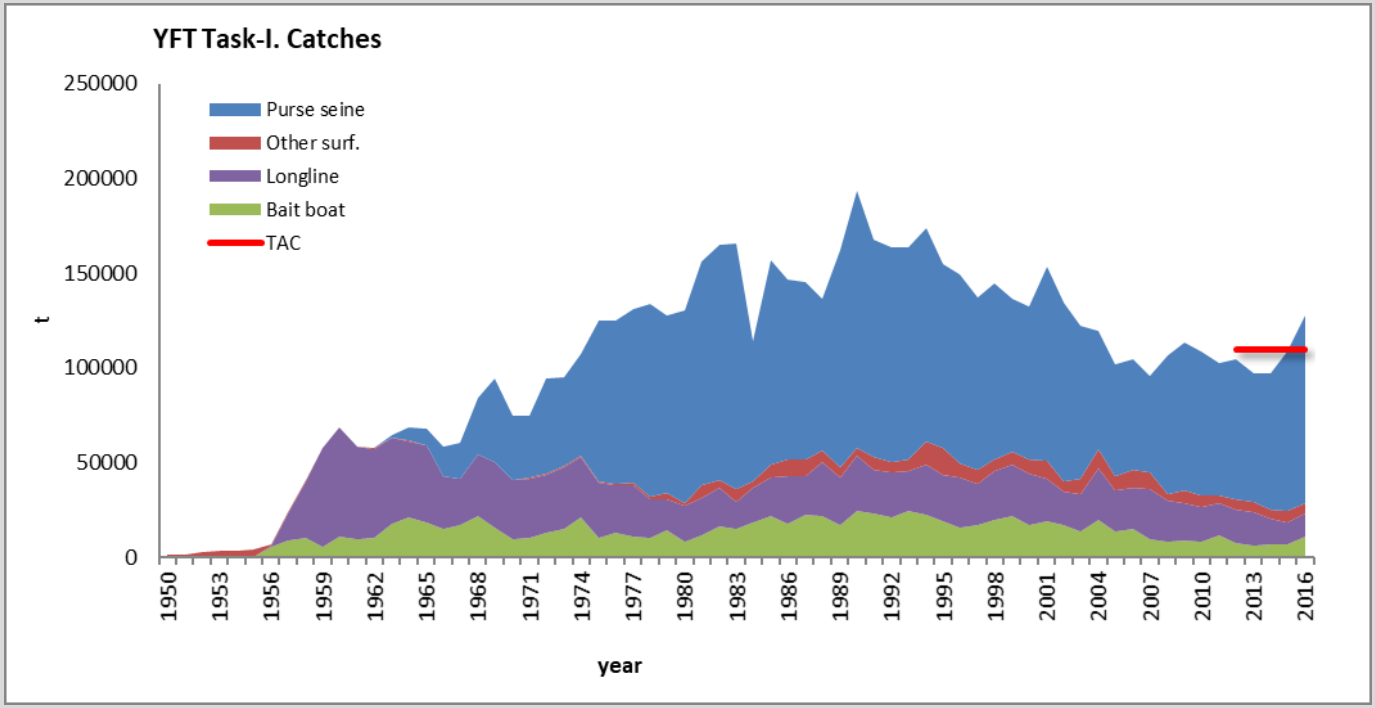
SKJ West(2014)

SKJ East not likely to be overfished, not likely to be suffering overfishing

Fisheries Indicators YFT

- 3 Major Gears (PS, BB, LL)
- Total Landings increased to 194,000 t by 1990, but had decreased to 109,810 t in 2015
- Provisional 2016 estimate 127,800 t
- Since 2012,

TAC = 110,000 t



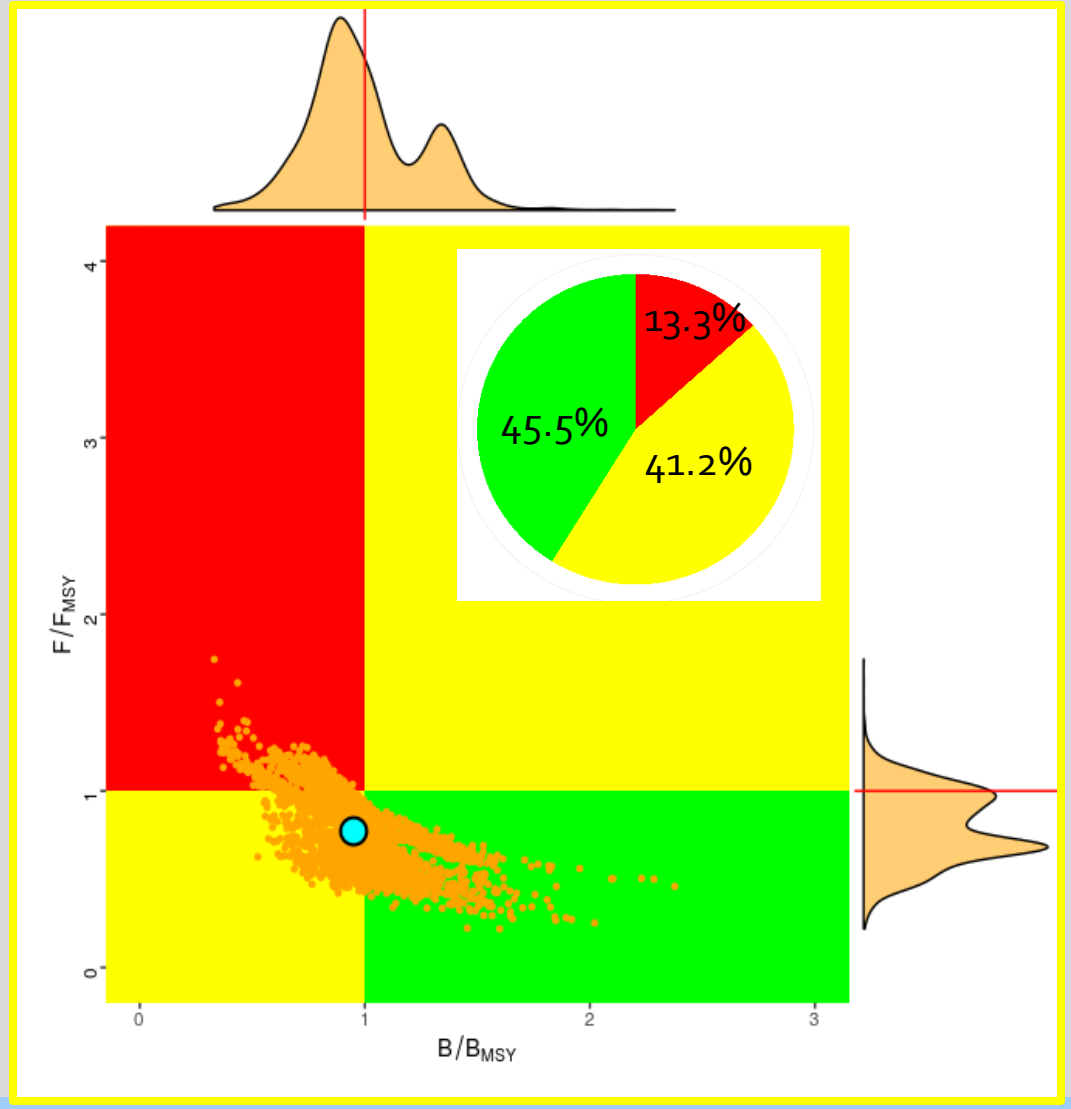
Stock Status 2014 YFT

- Combined 7 models, equally weighted.

- B/B_{MSY} = 0.95;
  - Overfished

- F/F_{MSY} = 0.77
  - Not Overfishing

- MSY = 126,000 t



YFT Outlook

- Maintaining the current TAC of 110,000 t was expected to maintain healthy stock status through 2024 with >68% probability, increasing to 97% by 2024.

Current TAC

TAC	2017	2018	2019	2020	2021	2022	2023	2024
60,000	75	91	99	99	99	99	100	100
70,000	74	87	97	99	99	99	99	99
80,000	73	86	96	99	99	99	99	99
90,000	71	82	91	97	99	99	99	99
100,000	70	80	89	92	96	97	99	99
110,000	68	78	85	90	92	95	96	97
120,000	65	73	79	78	79	80	82	82
130,000	57	59	61	61	57	54	50	48
140,000	45	44	38	33	31	31	31	30
150,000	31	24	21	20	19	20	20	20

Joint Probability that $B>B_{MSY}$ and $F<F_{MSY}$

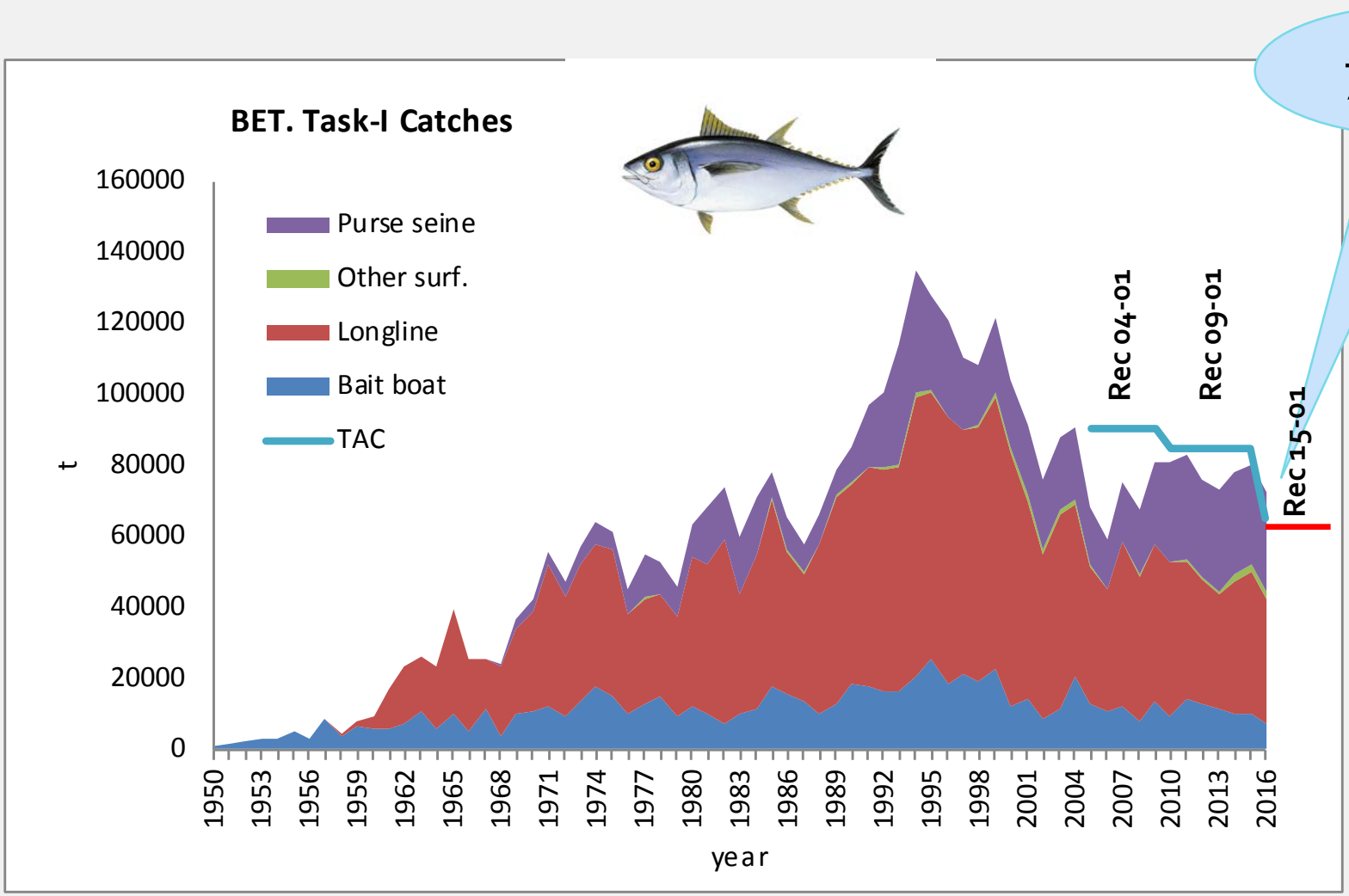
As the actual 2016 catches exceeded the values assumed for projections and the TAC (by 16%), the percentages above, are likely to be optimistic.

YFT Management Recommendations

- The Committee continues to recommend that effective measures be found to reduce FAD-related and other fishing mortality of small yellowfin tuna. Second Meeting of the Ad Hoc Working Group on FADs (*Bilbao, Spain, 14-16 March 2016*) (SCRS/2016/003).

- The efficacy of the revised area-time closure [Rec. 16-01] will be evaluated in 2018.

Fisheries Indicators BET



A 9 % decrease from 2015 catches but 11 % larger than 2016 TAC

BET 2015 Assessment

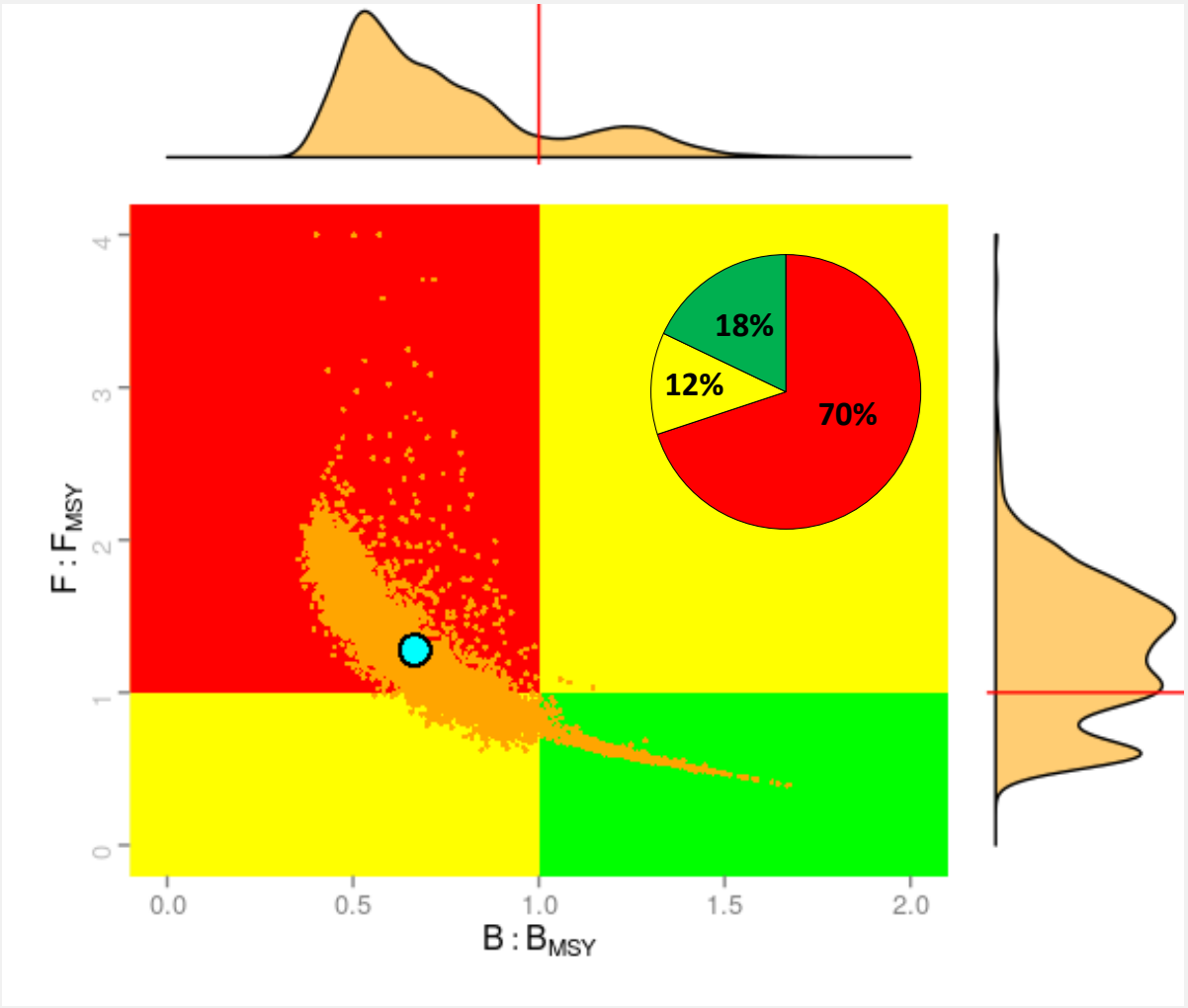
Status for 2014

- ✓ Catch 2016 ~ 72,375 t
- ✓ Average catch 2012-2016
- ✓ ~ 72,911 t
- ✓ TAC 2016 65,000 t

- ✓ MSY = 78,824 t.
- ✓ (67,725 – 85,009 t)

- ✓ B_{2014}/B_{MSY} ~ 0.67
- ✓ (0.48–1.20) – Overfished

- ✓ F_{2014}/F_{MSY} ~ 1.28
- ✓ (0.62–1.85) - Overfishing



BET Assessment

MANAGEMENT RECOMMENDATION

- Projections indicated that catches at the current TAC level (65,000 t) would have 49% chances of achieving Convention objectives by 2028.
- This probability may be improved by the additional measures (i.e. FAD moratorium) agreed by the Commission.

Probability of being in the green zone (B>Bmsy and F<Fmsy)

Catch (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	98	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
65	17	17	17	18	22	26	30	33	36	39	42	44	46	49
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

BET Assessment

MANAGEMENT RECOMMENDATION

- 2016 catches (72,375 t) exceeded the TAC of 65,000 t by 11%. Therefore, the probability of achieving Convention objectives by 2028 ($B>B_{MSY}$, $F<F_{MSY}$) would decrease to around 40 % if 2016 catches are maintained.

Probability of being in the green zone (B>Bmsy and F<Fmsy)

Catch (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	98	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	28	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

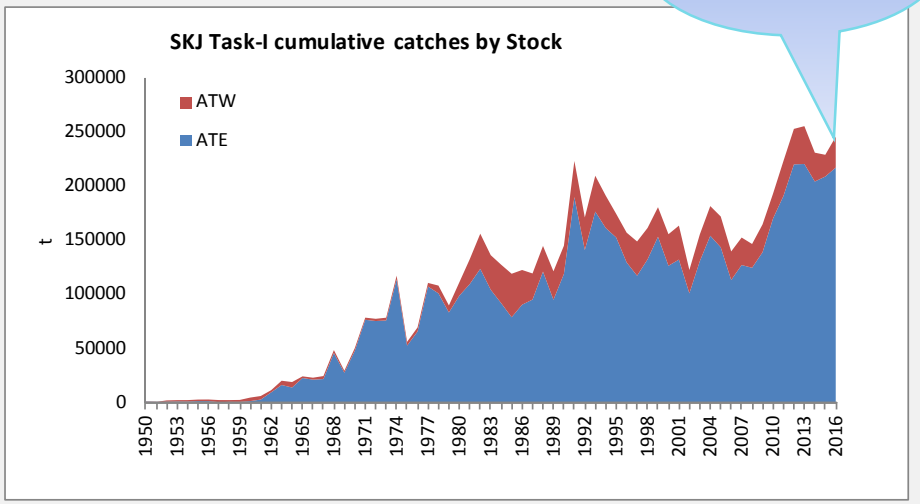
Bigeye tuna Recommendations

- The Commission should be aware that increased harvests on FADs could have had negative consequences for the productivity of bigeye tuna fisheries (e.g. reduced yield at MSY and increased SSB required to produce MSY) and, therefore, should the Commission wish to increase long-term sustainable yield, the Committee continues to recommend that effective measures be found to reduce FAD-related and other fishing mortality of small bigeye tunas

- The Commission should be aware that increased harvests on FADs could have negative consequences for yellowfin and bigeye tuna, as well as other by-catch species*.

Fisheries Indicators SKJ

245,933 t

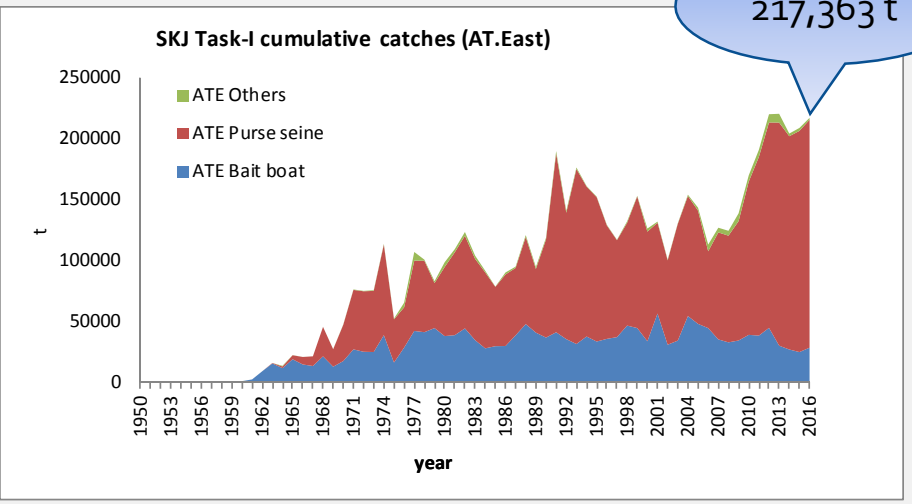


Catches – Tasks I and II

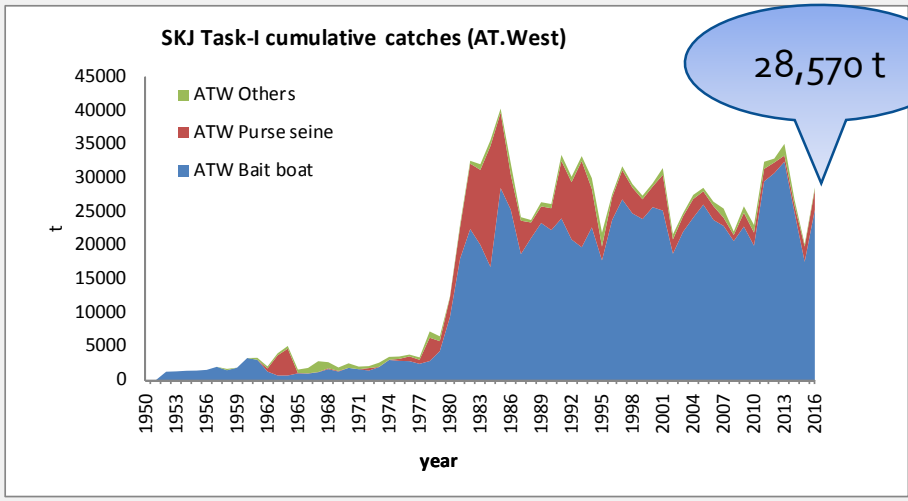
- Decline in catch since the early 1990s (due to a decrease in nominal fishing effort and/or to a moratorium effect), followed by a new strong increase in the recent years (2012 historic record)

- Catchability of SKJ increased in the early 1990s due to FADs fishing

217,363 t



28,570 t

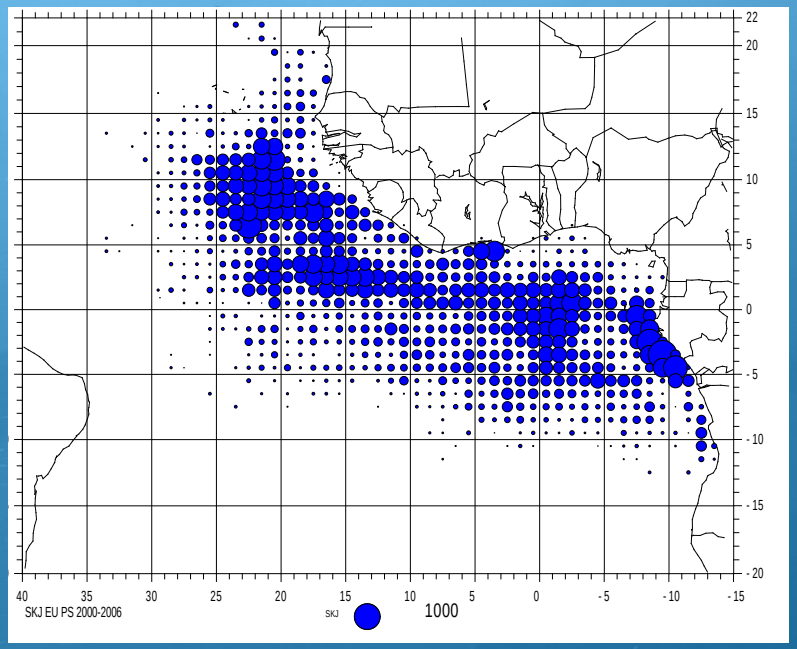


Fisheries indicators

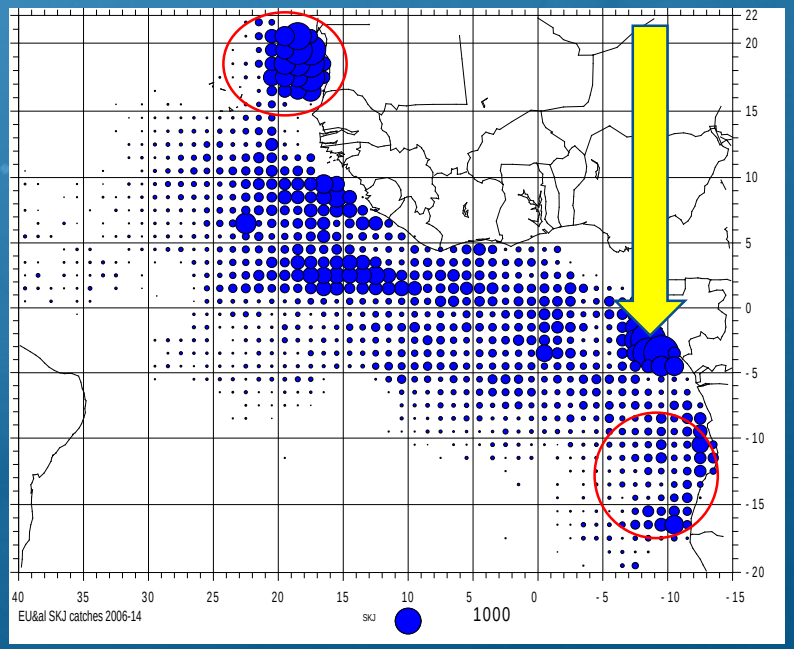
Spatial distribution of EU PS fleet Catch of SKJ

Mauritania

Angola



EU PS fleet

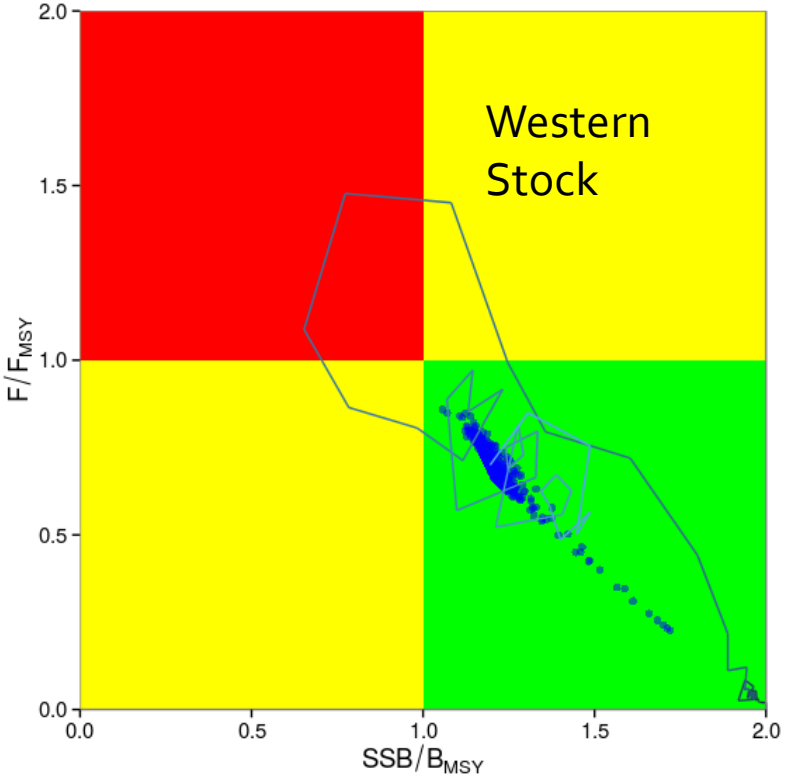


2000-2006

2007-2016

Catches away from the equatorial area have increased in the last 10 years

State of the stocks



	East Atlantic	West Atlantic
Maximum Sustainable Yield (MSY)	Probably higher than previous estimates (143,000-170,000)	Around 30,000-32,000 t
Current yield (2016)	**217,363 t**	**28,570 t**
Current Replacement Yield	Unknown	Somewhat below 32,000 t
Relative Biomass (B_{2013}/B_{MSY})	Likely >1	Probably close to 1.3
Mortality due to fishing (F_{2013}/F_{MSY})	Likely <1	Probably close to 0.7
Management measures in force	Rec. 16-01	None

Skipjack tuna management recommendations

- The SCRS does not change the advice provided since 2014:

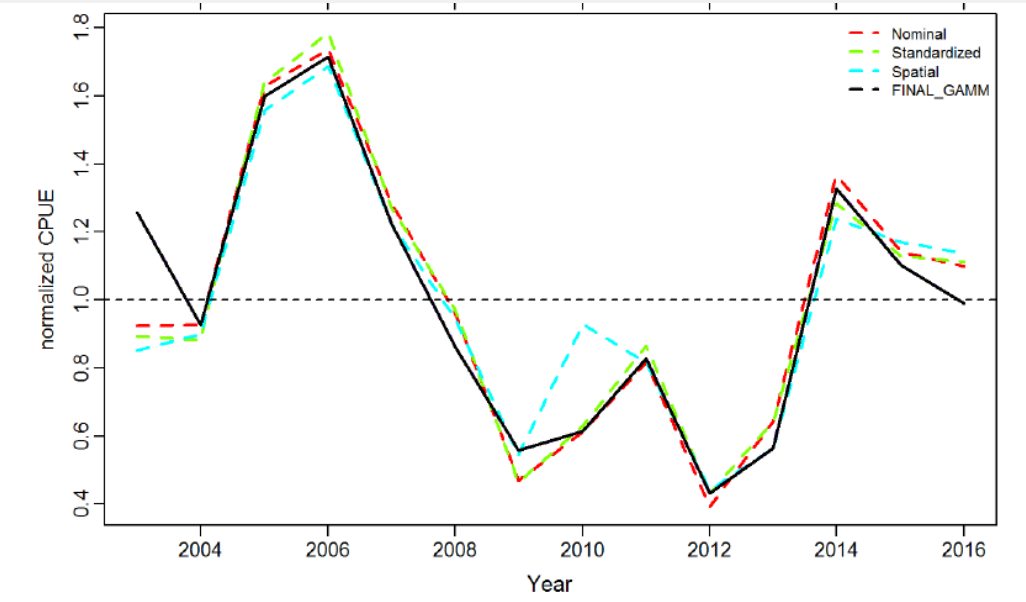
For the eastern stock

Increasing harvests and fishing effort for skipjack could lead to undesirable consequences for other species (particularly juveniles of yellowfin and bigeye) that are caught in combination with skipjack in certain fisheries

For the western stock:

Catches should not be allowed to exceed the MSY.

Improvements in data available for assessment of tropical tunas



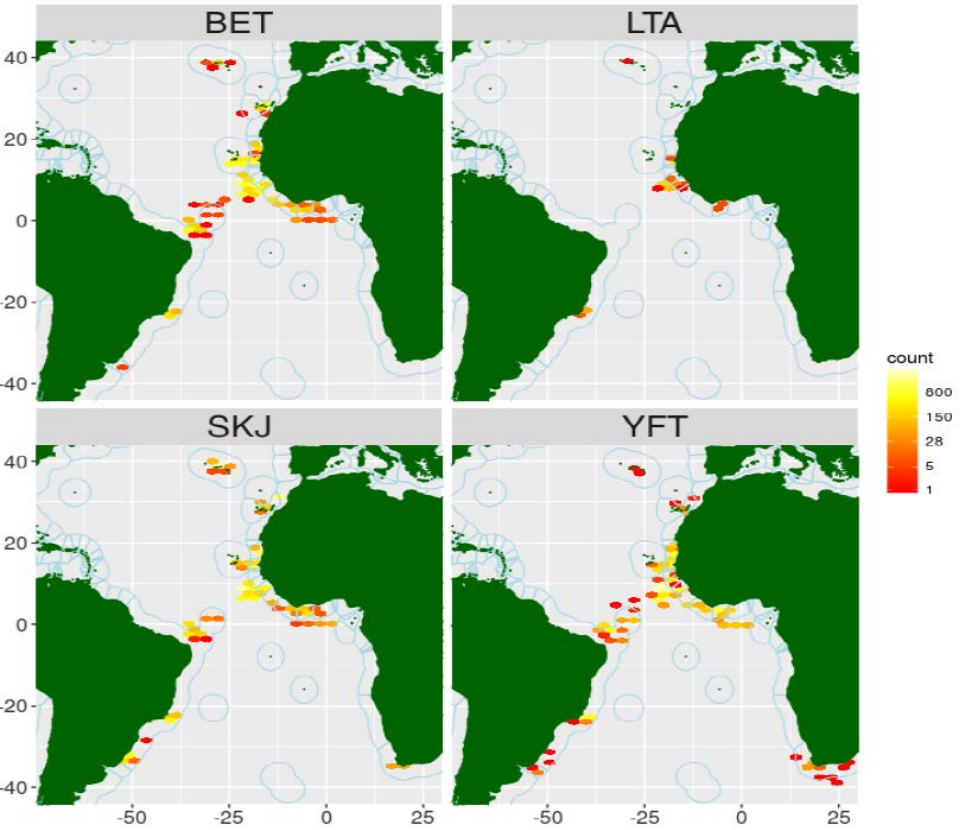
New YFT index of the South African pole-and-line fishery 2003-2016 (SCRS/2017/206)

New information on growth, migration, habitat use and mortality will come from the AOTTP tagging program

AOTTP

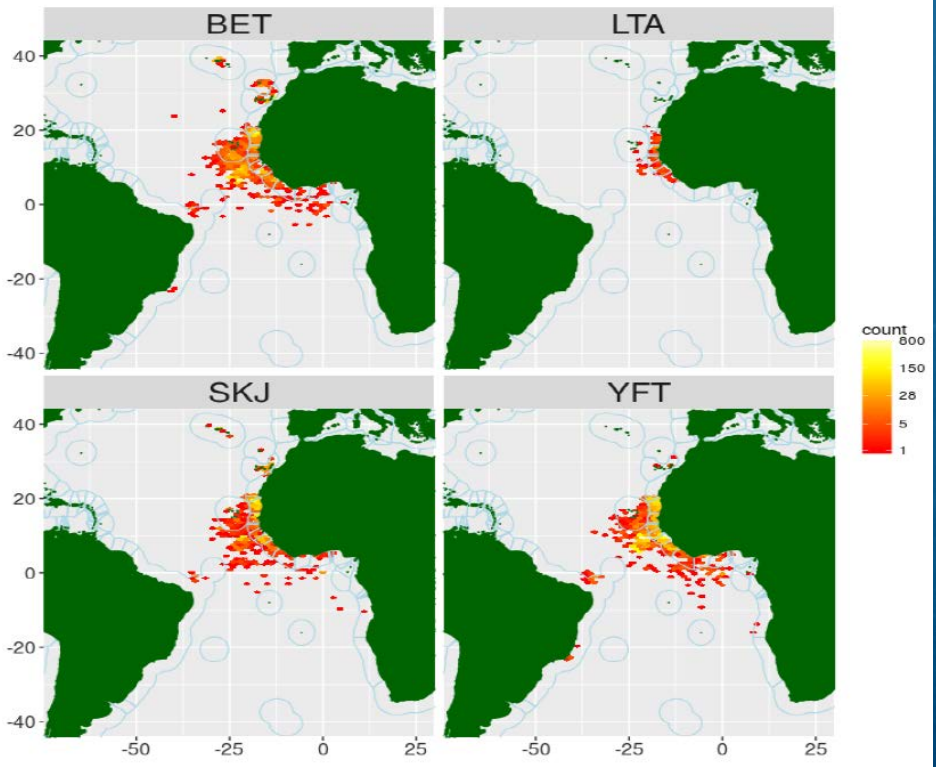
Successfully tagged and released more than 57,000 fish, in many of the major fishing areas of the Atlantic. Aim to tag in the NW quadrant in 2018

Tag releases at sea (spaghetti)



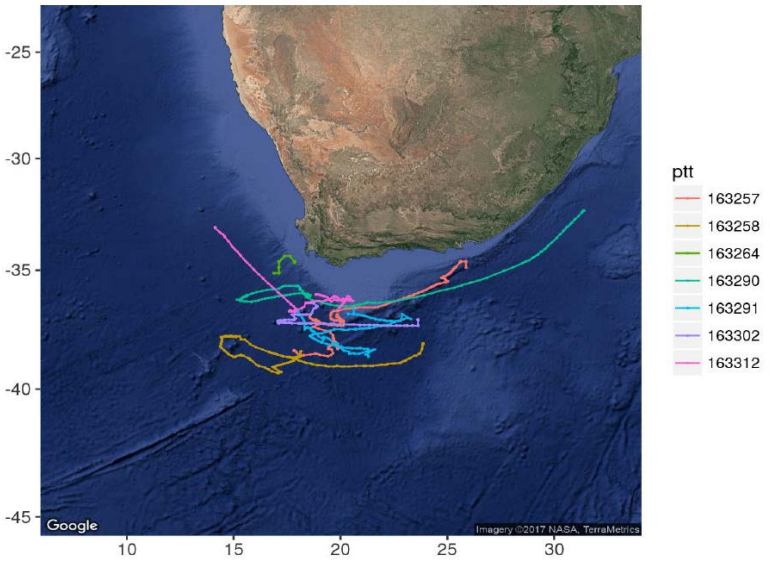
Species	Releases	Recoveries	Rate %
Bigeye	15678	3511	22%
Little tunny	804	176	22%
Skipjack	21293	2295	11%
Wahoo	23	0	0%
Yellowfin	19704	4711	24%
Total	**57,628**	**10,640**	**20%**

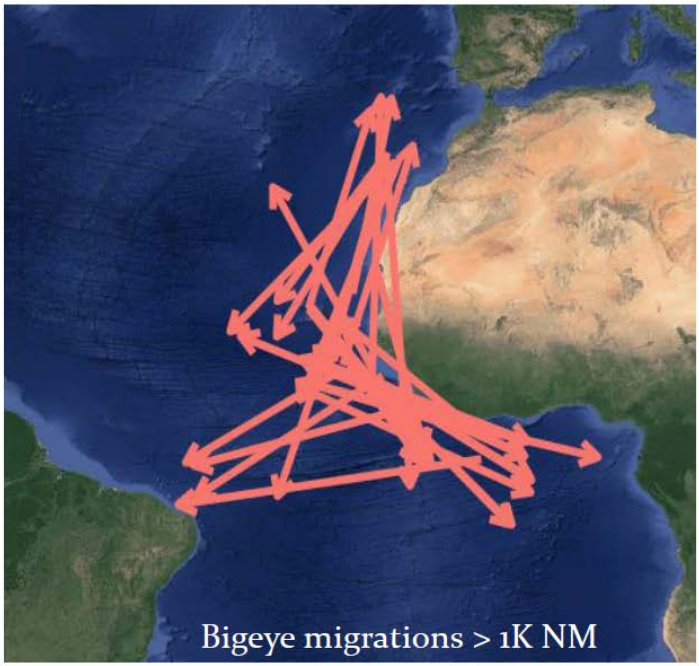
Tag recoveries (spaghetti)

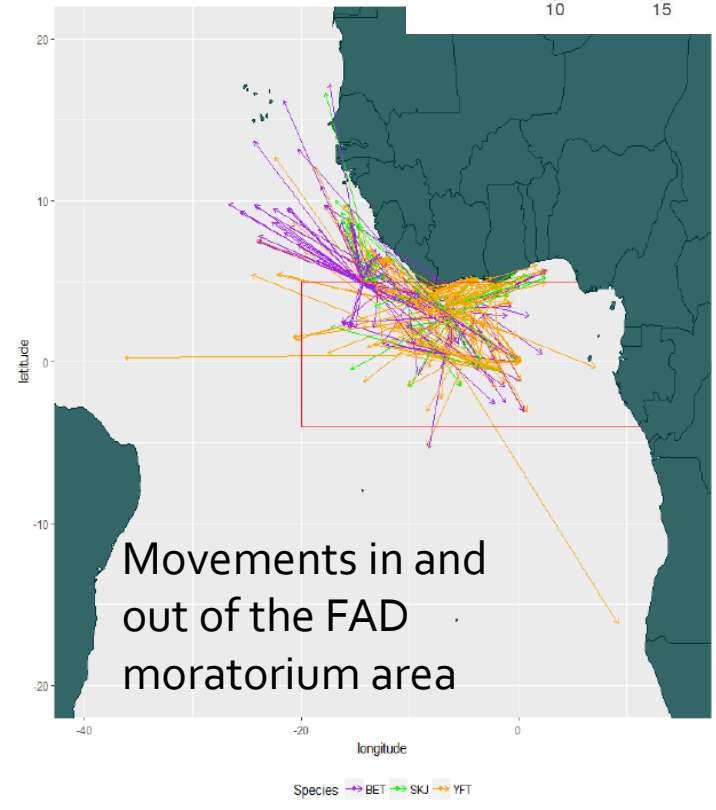


Learning about migration, growth, management impacts

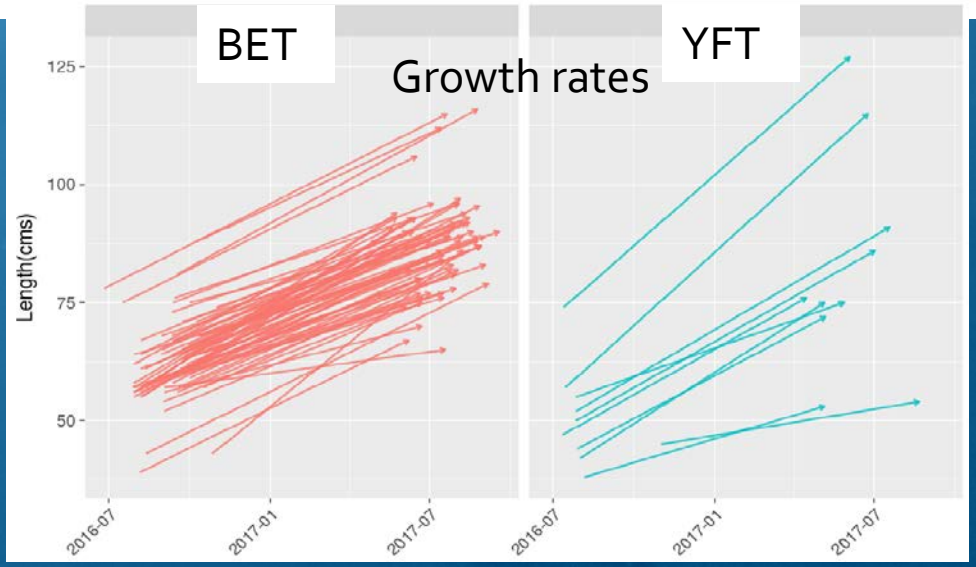
AOTTP – migrations (pop-up tags)







Movements in and out of the FAD moratorium area



Reduce uncertainty around the Kobe phase plot

AOTTP – Capacity building

Tag-recapture data

- ICCAT-AOTTP will collect and validate data, pay rewards and store the data

Tag-recapture statistics

- ICCAT-AOTTP will present summary statistics to relevant SCRS WGs

Research priorities identified by SCRS

- ICCAT-AOTTP organise capacity building activities (workshops, study visits)

At sea

In port

International teams to analyze data

Late 2017- early 2018
Training workshops and study visits to build up in-country capacity to carry out analyses of data.
ICCAT HQ, Abidjan….

Responses to Commission's requests

20.1	Ghana's comprehensive and detailed capacity management plan on the level of catches. Rec. 16-01, paragraph 12c
20.2	Evaluate the efficacy of the area/time closure referred to in paragraph 13 in relation with the protection of juveniles of tropical tunas. Rec. 16-01, paragraph 15
20.3	Review its 2016 recommendations on observer coverage and advise the Commission on appropriate coverage levels. Rec. 16-01, paragraph 42
20.4	Recommendations made by the FAD Working Group (Annex 8) and develop a work plan. Rec. 16-01, paragraph 49 (a)
20.5	Provide performance indicators for skipjack, bigeye and yellowfin tuna, with the perspective to develop management strategy evaluations for tropical tunas. Rec. 16-01, paragraph 49 (b)
20.6	Develop a table that quantifies the expected impact on MSY, BMSY, and relative stock status for both bigeye and yellowfin resulting from reductions of the individual proportional contributions of major fisheries to the total catch. Rec. 16-01, paragraph 49 (c) (*)
20.7	Evaluate the contribution of by-catches and discards to the overall catches in ICCAT tropical tuna fisheries, on a fishery by fishery basis. Rec. 16-01, paragraph 53
20.8	Advise the Commission on possible measures allowing to reduce discards and to mitigate onboard post-harvest losses and by-catch in ICCAT tropical tuna fisheries. Rec. 16-01, paragraph 53

Responses to Commission's requests

20.1	Ghana's comprehensive and detailed capacity management plan on the level of catches. Rec. 16-01, paragraph 12c

"…This work could not be conducted in time to respond to the Commission in 2017. The Group recommended that the Secretariat compile the data needed to support the analysis of Ghanaian fishing capacity in time to conduct these analyses in 2018. . "

Responses to Commission's requests

20.2	Evaluate the efficacy of the area/time closure referred to in paragraph 13 in relation with the protection of juveniles of tropical tunas. Rec. 16-01, paragraph 15

"…The current area/time closure was implemented for the first time in 2017 and only preliminary analysis was completed in 2017. In 2018 the Committee plans to:

- Examine the catch, effort and size frequency of YFT and BET by 1x1 grid and month.
- Analysis of the historic surface fleet using purse seine fishery data in relation to the environmental parameters.
- Evaluate time/area closures that could achieve certain percentage reductions (10% to 50%) in the annual catches of juvenile yellowfin and bigeye tuna.
- Provide information on how these reductions will affect the projected stock status (i.e. SSB/SSBMSY and F/FMSY) and recovery schedule, and other measures as possible (e.g. YPR, SPR). "

Responses to Commission's requests

20.3	Review its 2016 recommendations on observer coverage and advise the Commission on appropriate coverage levels. Rec. 16-01, paragraph 42

- SCRS continues to conclude that current required level of scientific observers (5%) seems to be inappropriate to provide reasonable estimates of total by-catch and recommends increasing the minimum level to 20%.

- The SCRS recommends that tropical tuna purse seine fleets or CPCs wishing to voluntarily implement EMS follow the guidelines described in Ruiz et al. 2017. This source of information would help improve current coverage of observer data in tropical tuna fisheries.

- SCRS notes that information on fleets other than purse seine (longline, baitboat, artisanal) was not available to the SCRS"

Responses to Commission's requests

20.4	Recommendations made by the FAD Working Group (Annex 8) and develop a work plan. Rec. 16-01, paragraph 49 (a)

- PRESENTED at PLENARY:
- Final report was not available to SCRS plenary
- SCRS recommended that SCRS Chair, Tropical Tunas WG coordinator, Subcomm. Statistics rapporteur and bycatch rapporteur prepare workplan related to recommendations of the report to be presented to the SCRS during 2018

Responses to Commission's requests

20.5	Provide performance indicators for skipjack, bigeye and yellowfin tuna, with the perspective to develop management strategy evaluations for tropical tunas. Rec. 16-01, paragraph 49 (b)

- SCRS proposes to use indicators developed by ICCAT for N ALB as an initial list for each tropical tuna stock.
- Proposes additional indicators:
  - to evaluate the success of rebuilding, especially relevant to BET
  - indicators that reflect recruitment overfishing and growth overfishing, especially relevant given historical changes in selectivity

- Requests guidance from the Commission on what multispecies objective(s) the Commission may have, if any. Alternatively, the Commission will have to consider tradeoffs by examining species specific objectives for all stocks at the same time, for example if a single species control rule triggers an action, the action will affect all stocks.

20.5	Provide performance indicators for skipjack, bigeye and yellowfin tuna, with the perspective to develop management strategy evaluations for tropical tunas. Rec. 16-01, paragraph 49 (b)

The Committee noted that given the multi-species nature of the tropical tuna fishery, the MSE should take this into account and change the schedule of delivery to 2021, after the next YFT assessment, rather than 2020.

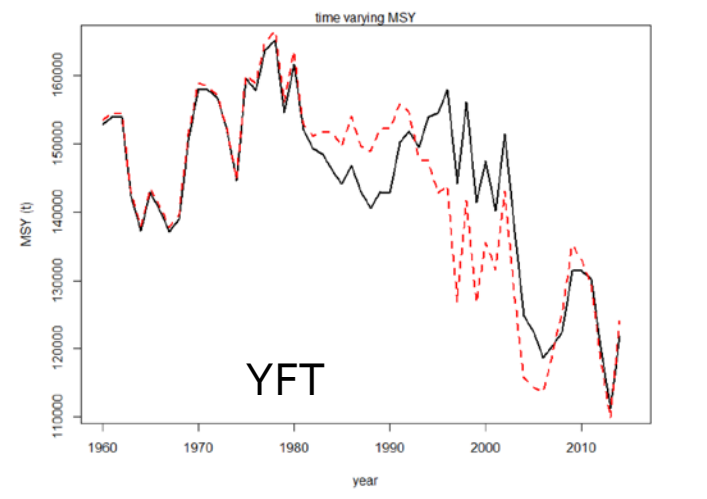
	2018	2019	2020	2021
Development of OM framework	X			
Conditioning of OM	X		X	X
Development of OM alternatives		X		
Development of MPs		X		X
Evaluation of MPs			X	X
Independent review of MSE process			X	
Production of documentation for stakeholders explaining results of MSE for BFT				X

Responses to Commission's requests

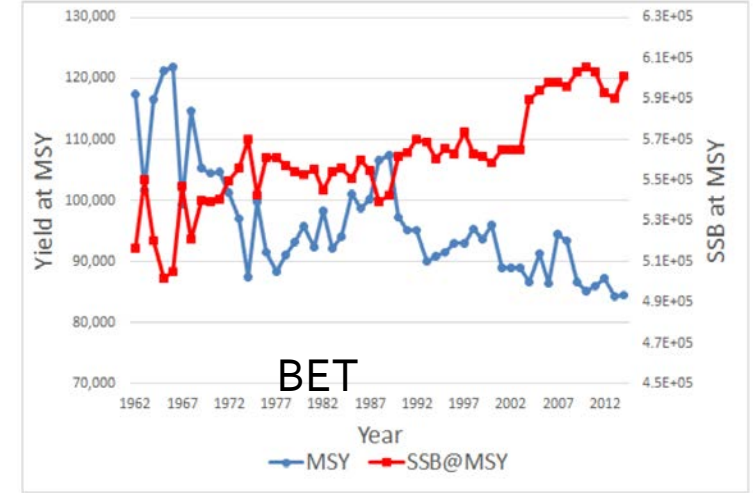
20.6	Develop a table that quantifies the expected impact on MSY, BMSY, and relative stock status for both bigeye and yellowfin resulting from reductions of the individual proportional contributions of major fisheries to the total catch. Rec. 16-01, paragraph 49 (c)

"Recent stock assessments of bigeye and yellowfin tunas demonstrate that current MSY may be below what was achieved in past decades because overall selectivity has shifted to smaller fish. The SCRS could not complete this work in 2017 and plans to conduct an analysis that will directly respond to this request in 2018.

MSY



MSY



The decline in MSY may have been as much as 30% from its historical maximum

Responses to Commission's requests

20.7	Evaluate the contribution of by-catches and discards to the overall catches in ICCAT tropical tuna fisheries, on a fishery by fishery basis. Rec. 16-01, paragraph 53

- *Unfortunately the analysis was done only with EU and associated purse seine fleets. Discarding practices and handling practices may, however, differ significantly and so cannot be extrapolated from EU purse seine information.*
- The majority of the by-catch consists of tunas: BET+YFT+SKJ that are discarded at sea (21% and 22% in FOB and FSC sets, respectively)
- While overall by-catch is higher in floating object sets than it is in free school sets, this is not always the case for different species groups. For instance, by-catches of billfishes, sharks and rays are of similar magnitude in FOB and FSC sets
- Reports on interactions with cetaceans, whale sharks and sea turtle

Responses to Commission's requests

20.8	Advise the Commission on possible measures allowing to reduce discards and to mitigate onboard post-harvest losses and by-catch in ICCAT tropical tuna fisheries. Rec. 16-01, paragraph 53

For **purse seine** notes that:

- limitation of FADs fishing effort (e.g. those from Rec. [16-01])is an indirect way to reduce discards
- Various measures to mitigate by-catch of vulnerable species (e.g. elasmobranchs, marine turtles) have been effectively tested and implemented at-seacould improve catch statistics and food security because there are local markets with high demand for these discards

An alternative is to prohibit discards. IATTC, IOTC and WCPFC have adopted management measures that prohibit the discarding of bigeye, yellowfin and skipjack in the purse seine fishery, except if the fish are unfit for human consumption or in case of insufficient well space during the last set in a trip.

Responses to Commission's requests

20.8	Advise the Commission on possible measures allowing to reduce discards and to mitigate onboard post-harvest losses and by-catch in ICCAT tropical tuna fisheries. Rec. 16-01, paragraph 53

CPCs could also consider other measures, e.g. market incentives, to increase utilization and reduce discards for all tropical tuna fisheries

For **longline fleets** notes that:

- safe handling of sea turtles on longliners is already advocated in Rec. [13-11]. Recs [11-08], [10-08] and [09-07]
- for silky, hammerhead and thresher sharks respectively require CPC vessels flying their flag to promptly release these sharks unharmed
- The use of monofilament instead of steel traces or leaders are also known to be effective to reduce shark by-catch
- the Commission to consider adopting at least one of the mitigation measures proposed by the SCRS for fisheries targeting swordfish and shark

Additional recommendations for tropical tunas

- The Committee recommends that, the combined historical "FIS" fishery (FRA+CIV+SEN, before 1991) be split in Task II (T2CE and T2SZ/CAS) and allocated to the respective CPC in the line of what was made in Task I catches in the past. The same break down is required (T2CE and CAS) for the combined tropical ETRO fisheries (NEI-ETRO combined fleet) affecting mainly purse seine before 2006. This task should be achieved before the next tropical tuna assessment.

- Bearing in mind that there is funding available to improve the Ghanaian statistics, the Committee reiterates the need for scientists from EU and Ghana to collaborate to adapt the T3 software, and encourages capacity building activities in African countries, particularly for Ghanaian scientists.

Proposed work plan activities 2018

- Bigeye tuna assessment (data preparatory and assessment meetings)
  - Including analysis of available AOTTP data

- MSE development
  - Communicate with the Commission to determine appropriate performance metrics for the Tropical Tuna MSE. Discuss performance metrics for single and/or multiple species models.
  - Develop and review operating models.

- Responses to the Commission not completed in 2017:
  - Evaluate the efficacy of the area/time closure referred to in paragraph 13 in relation with the protection of juveniles of tropical tunas.
  - Expected impacts on MSY and stock status of catch contribution from different fisheries/gears
  - Review Ghana's comprehensive and detailed capacity management plan (Rec. [16-01] paragraph 12c)