

20th meeting of LDAC

Working Group 1 - Highly Migratory Stocks and Tuna RFMOs

6 April 2017, Brussels

Review of the current state of FAD fisheries

JOSU SANTIAGO

AZTI. Tuna Research Area

Review of the current state of FAD fisheries

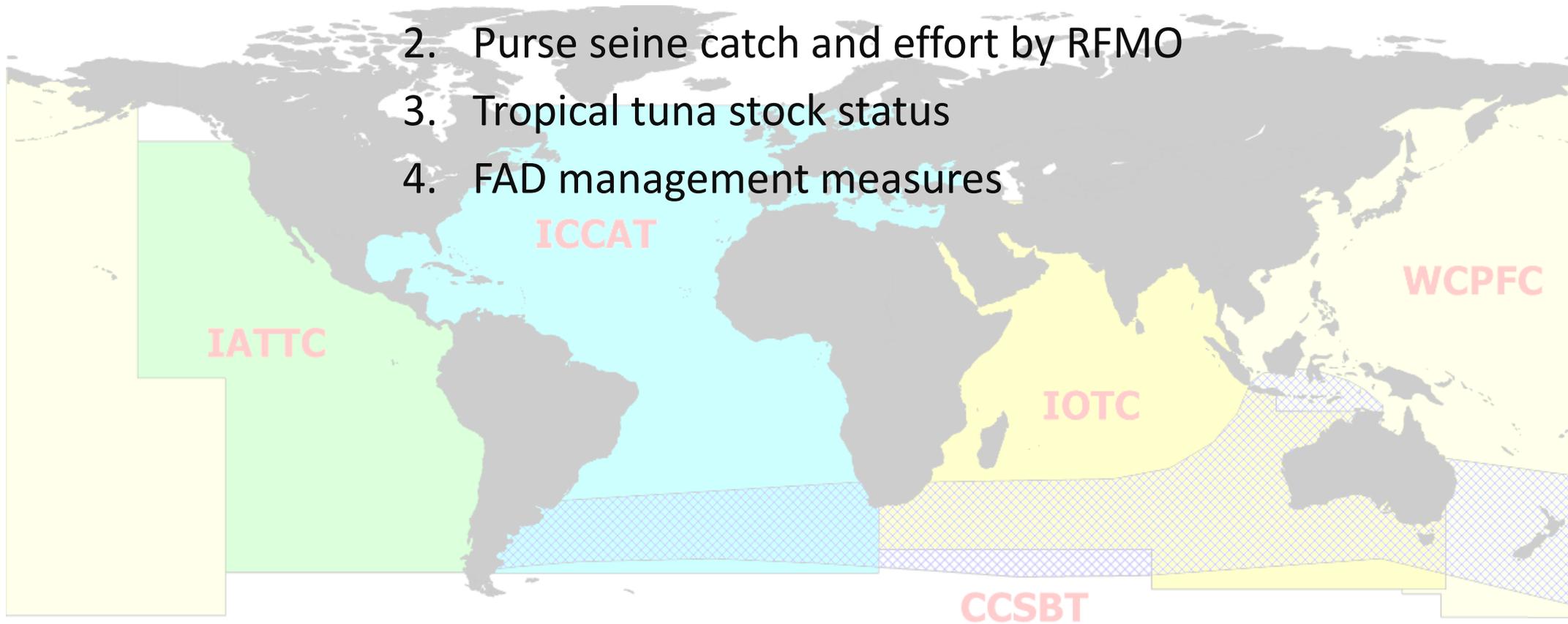
7. FADs management for tropical tuna purse seine fisheries
 - 7.1. Review of knowledge and work progress by RFMOs
 - a. Science perspective

8. Information on tropical tuna tagging programmes (YFT and BET) in the Atlantic and Pacific Ocean.

Review of the current state of FAD fisheries

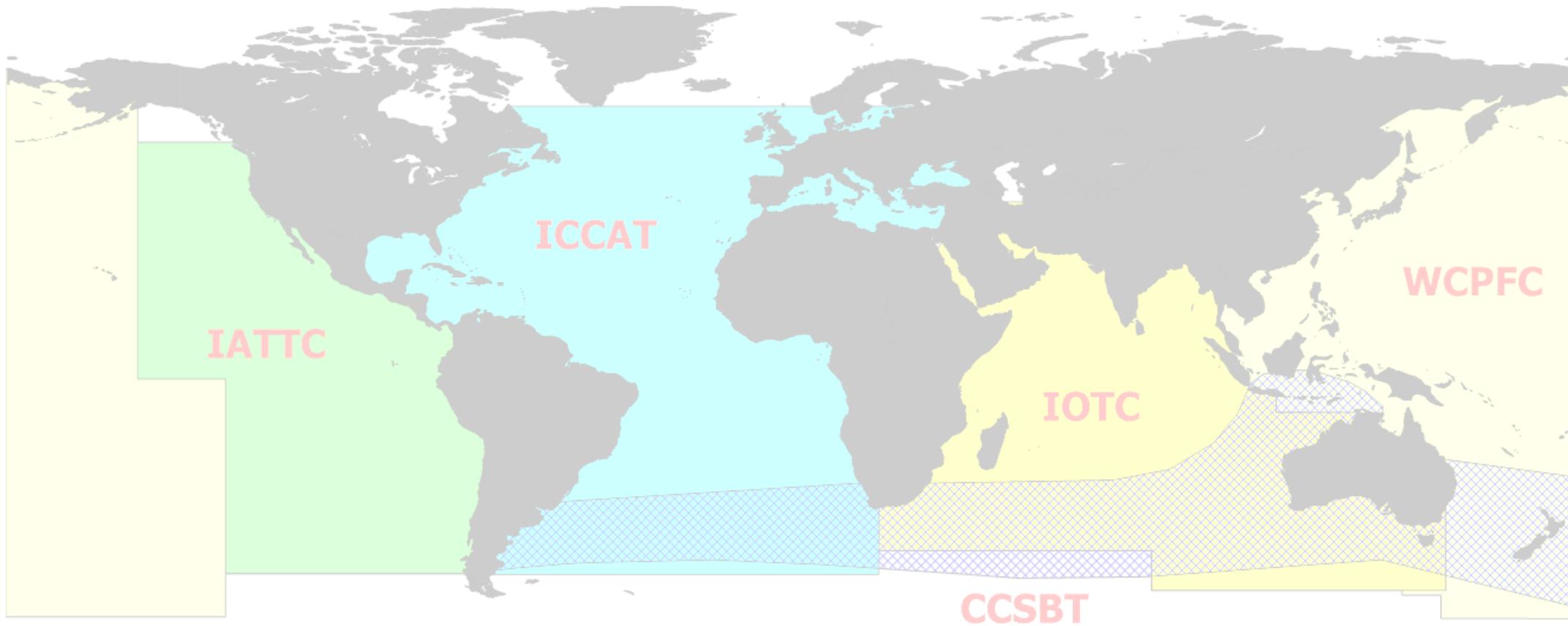
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1. Catch of tropical tunas
2. Purse seine catch and effort by RFMO
3. Tropical tuna stock status
4. FAD management measures

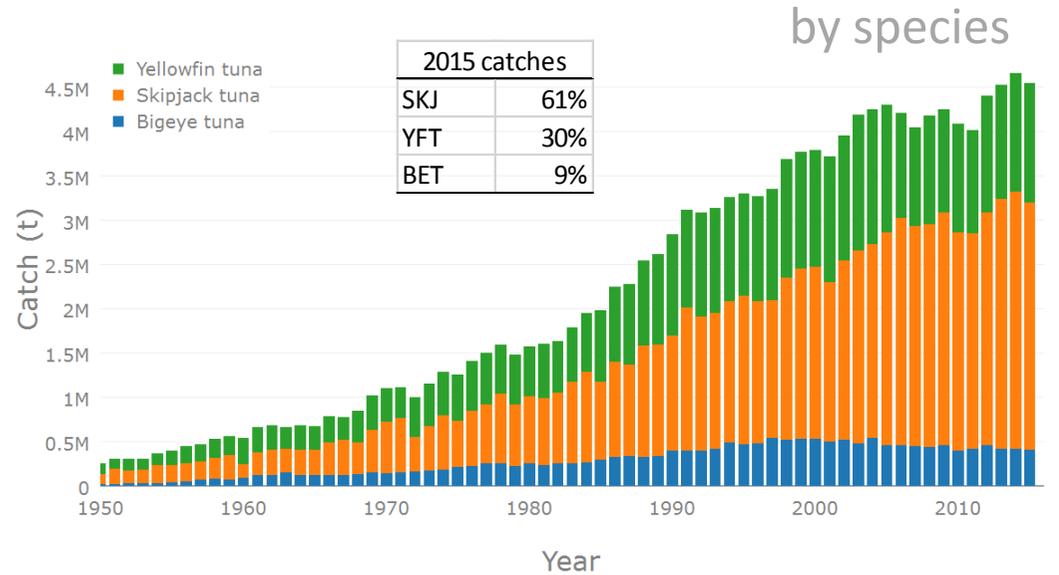
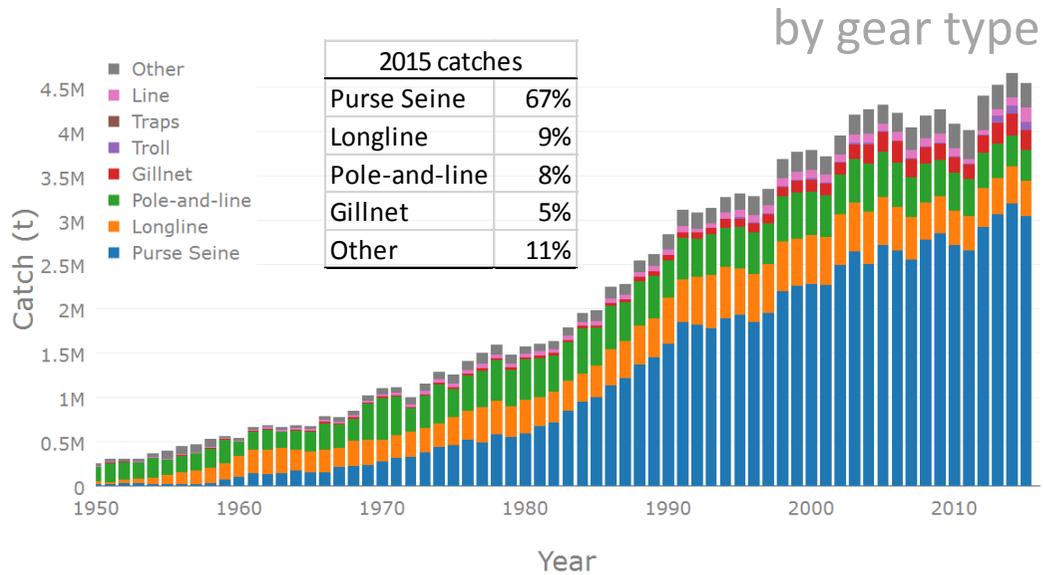
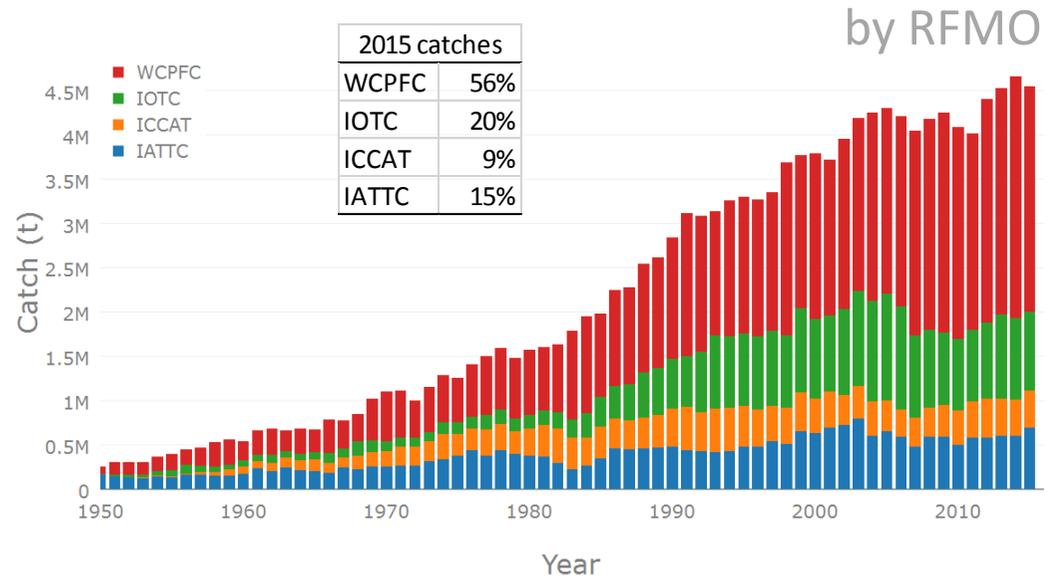
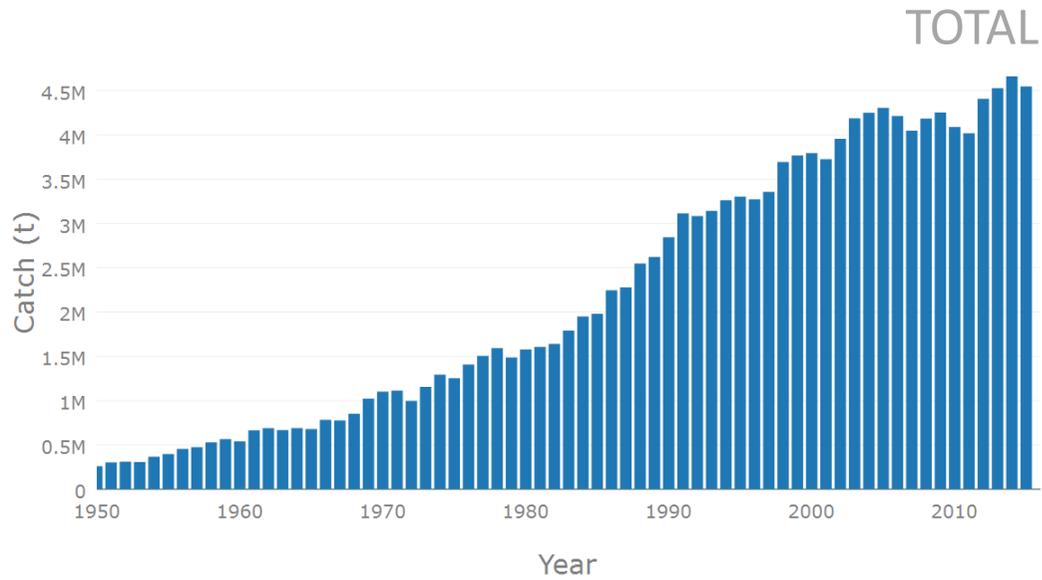


Review of the current state of FAD fisheries

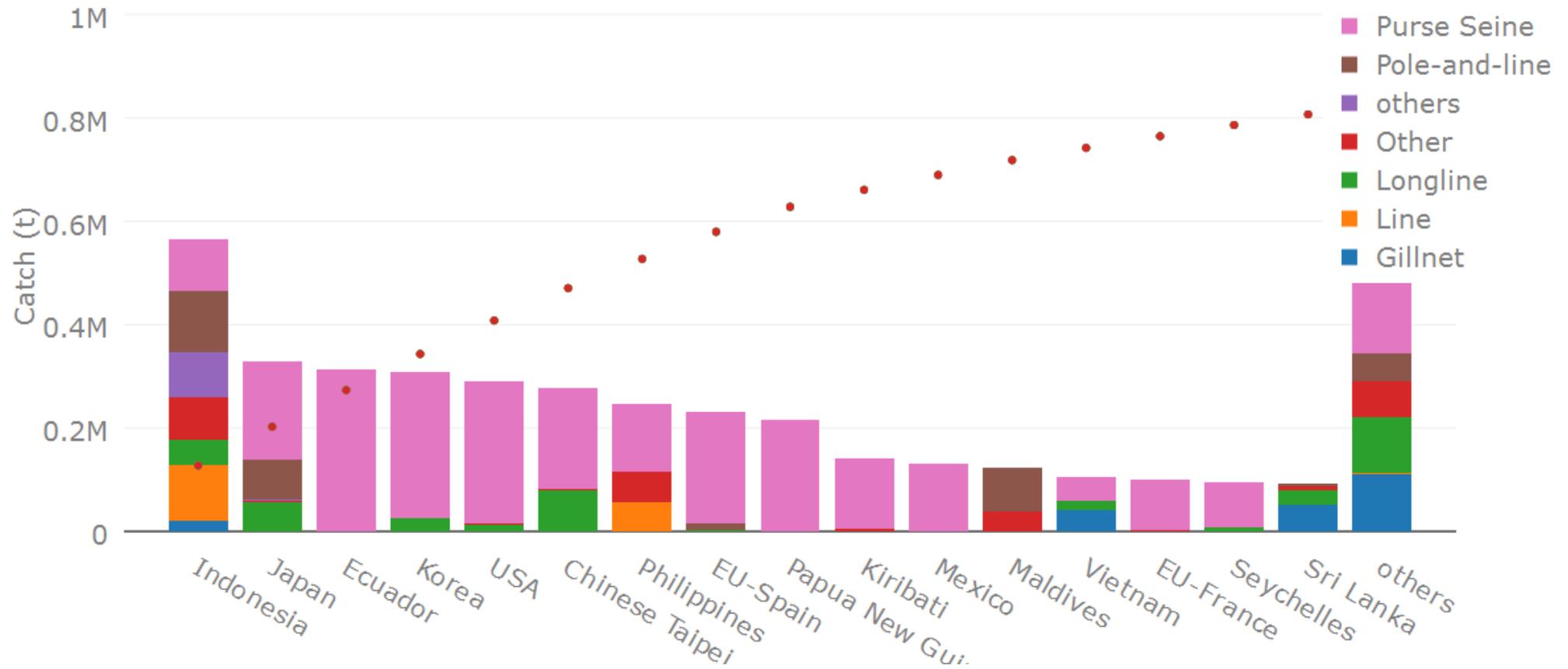
1. Catch of tropical tunas



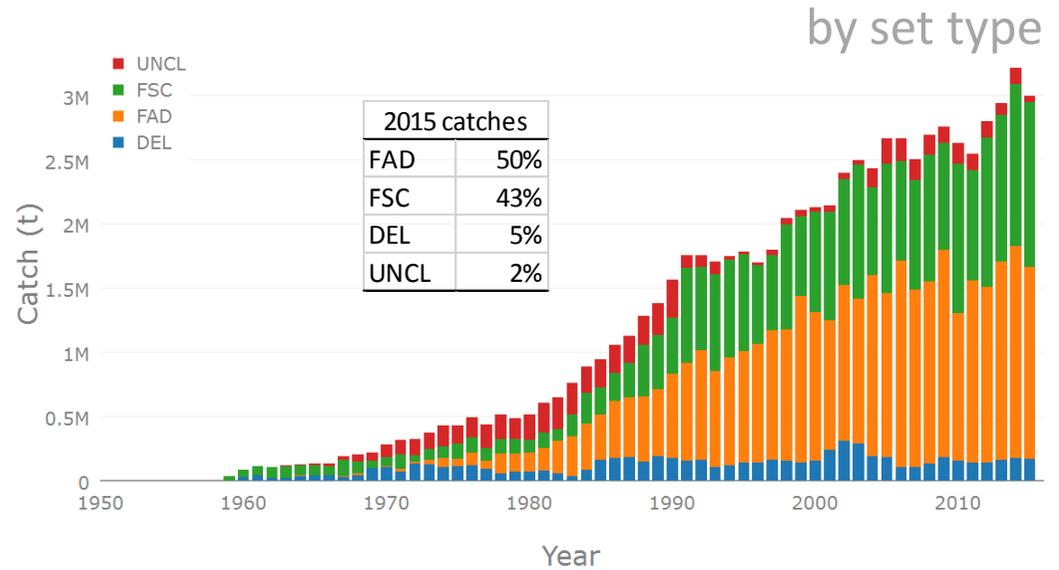
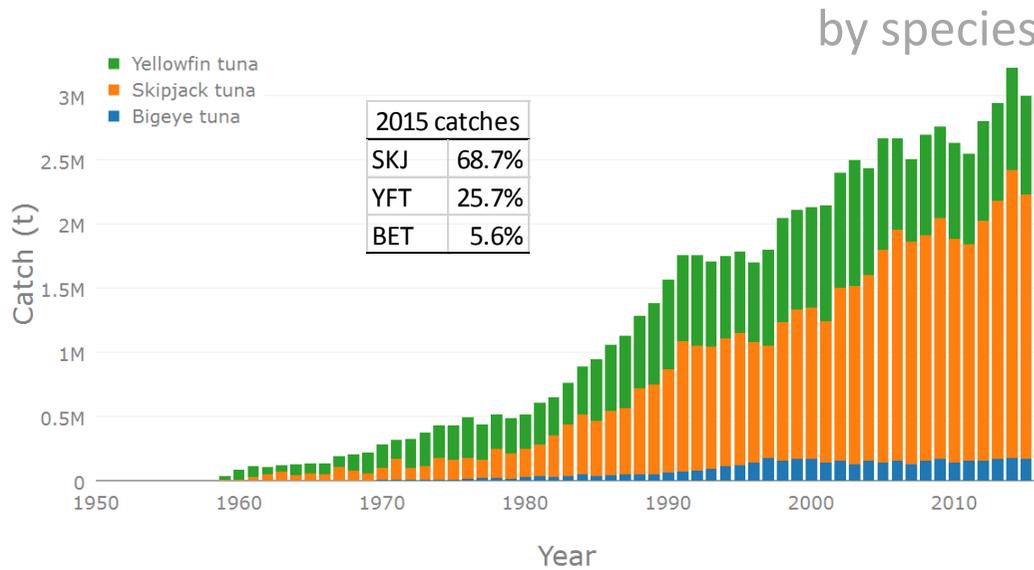
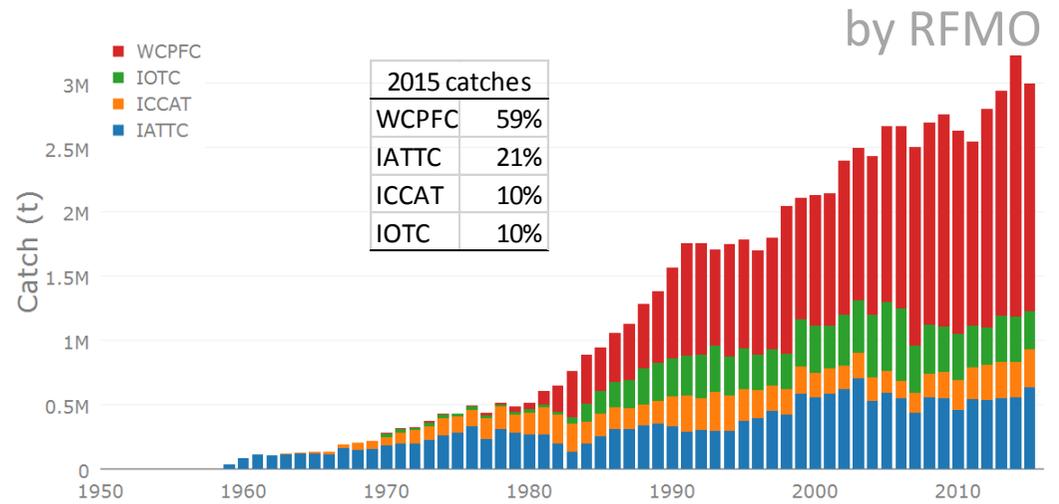
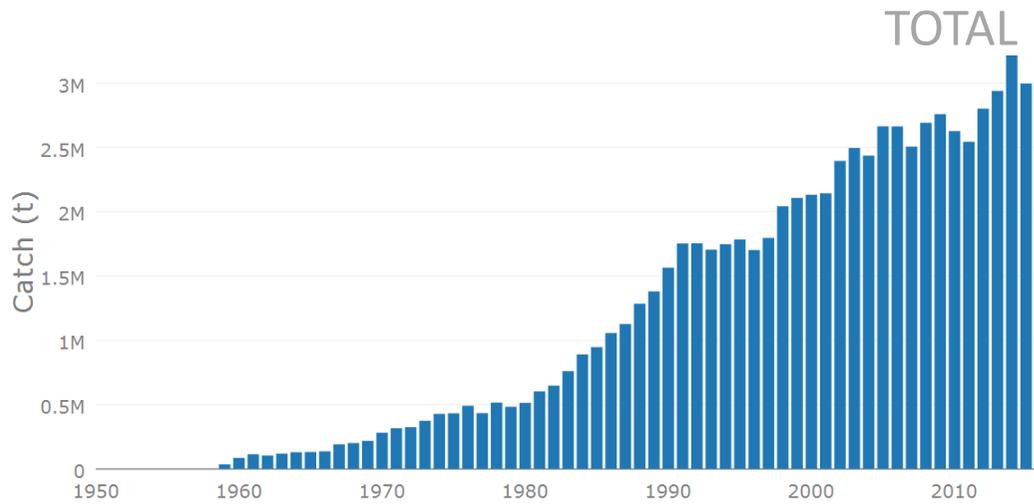
Reported catches of Tropical Tunas



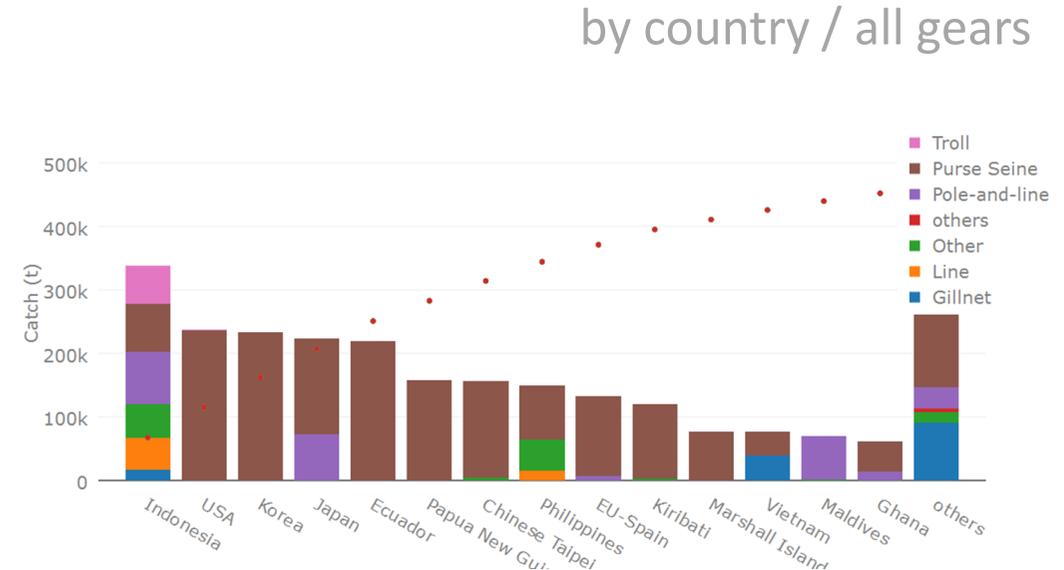
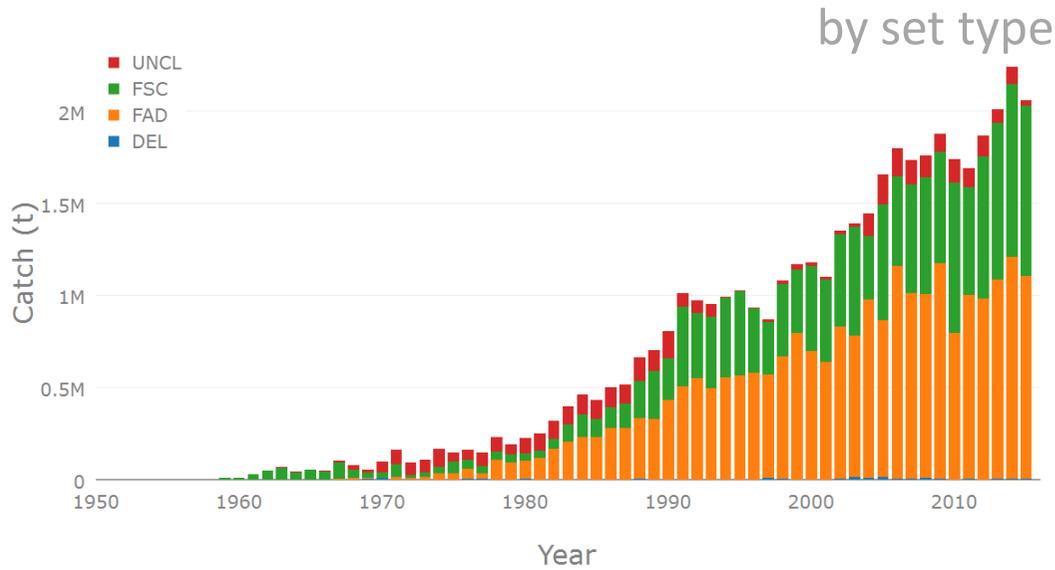
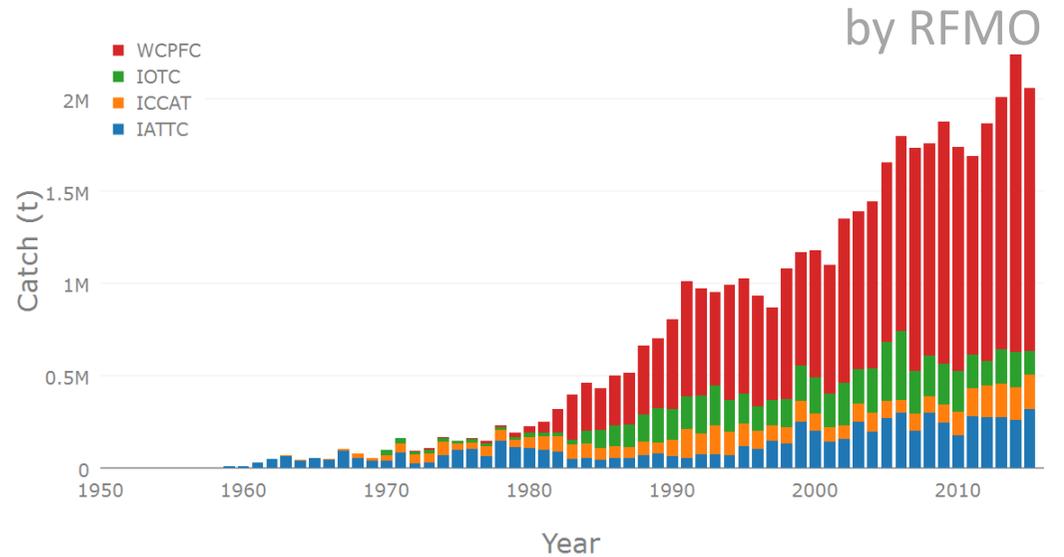
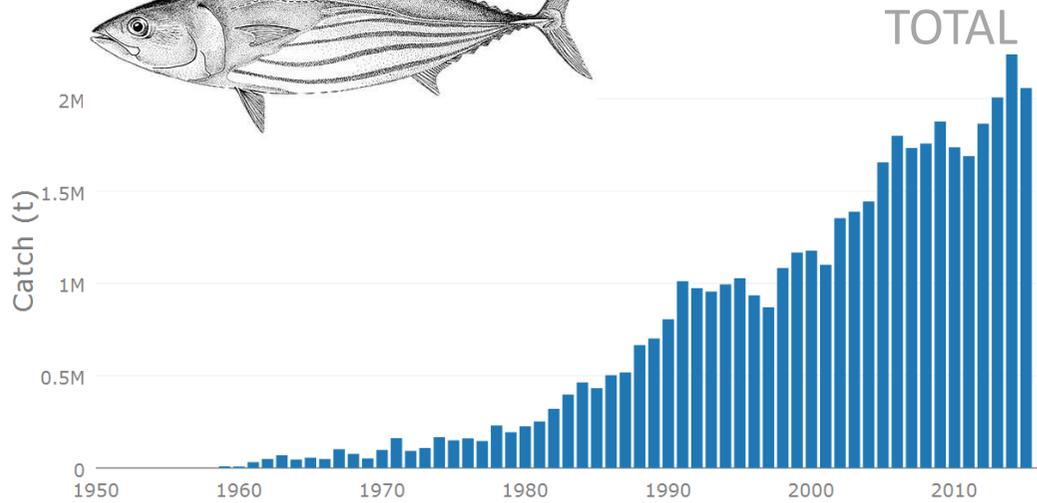
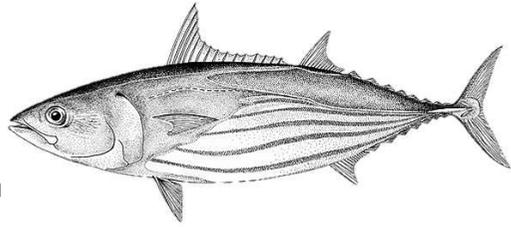
Reported catches of Tropical Tunas



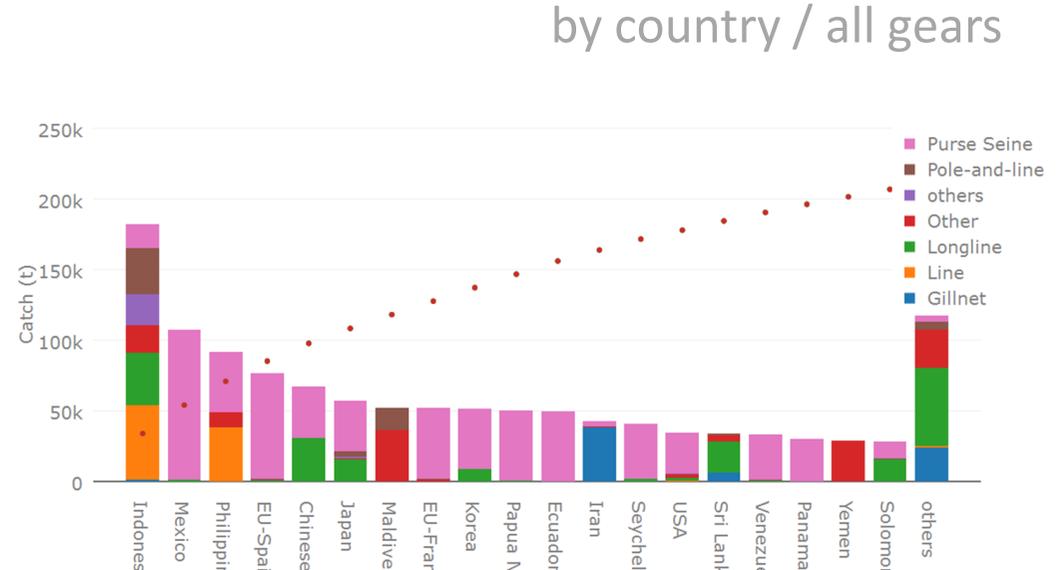
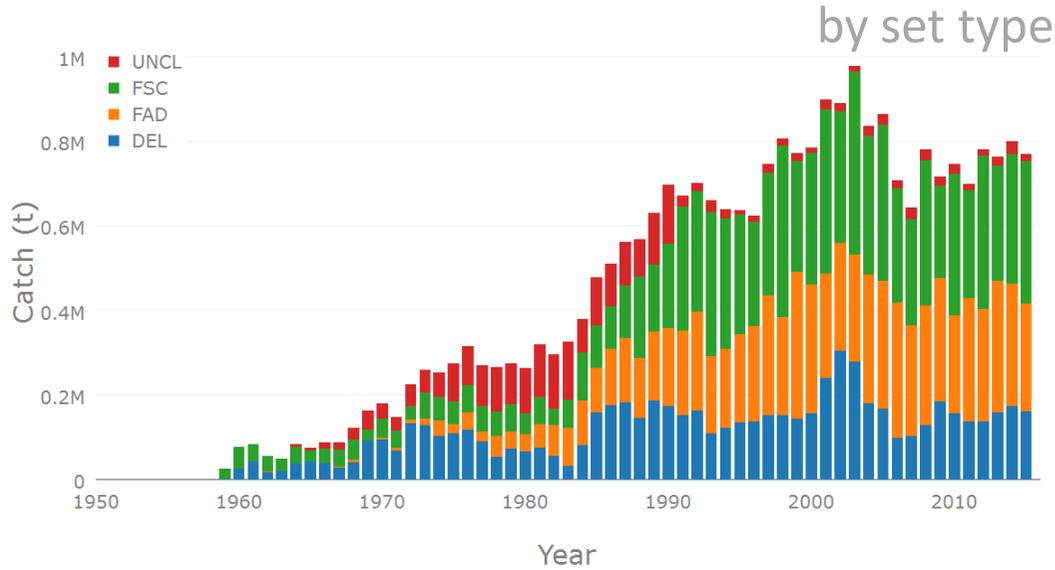
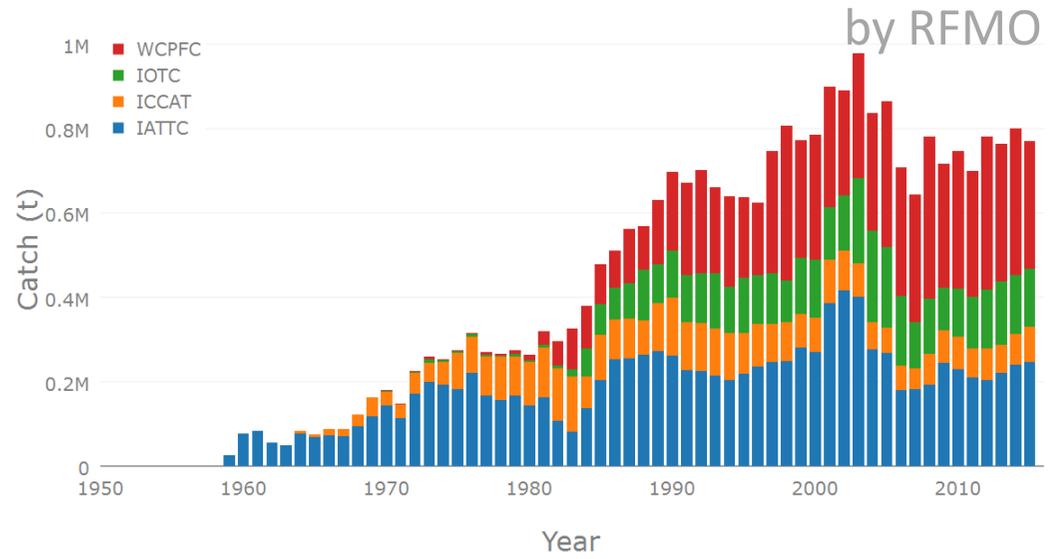
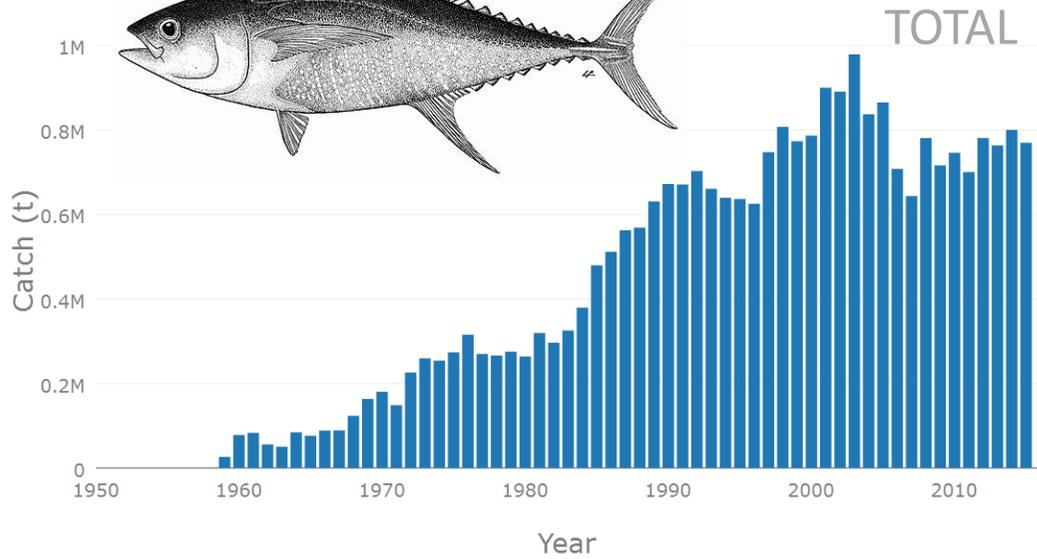
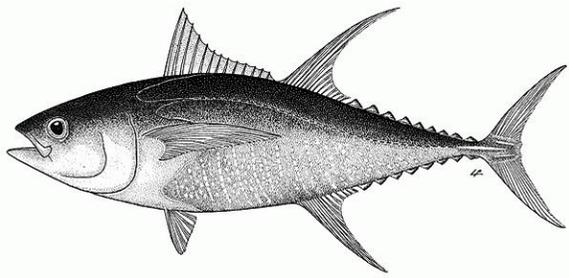
Reported catches of Tropical Tunas: PS



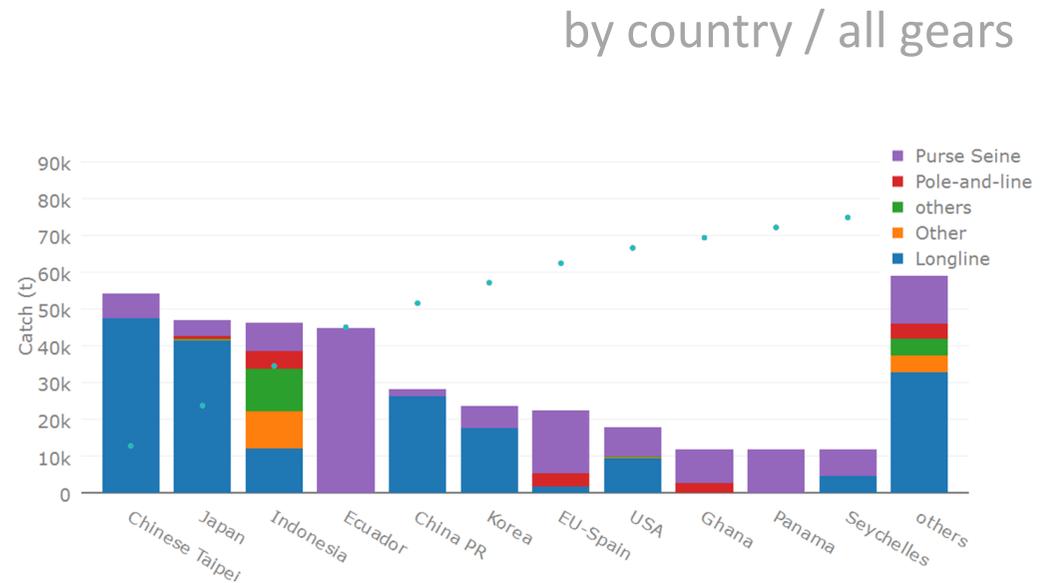
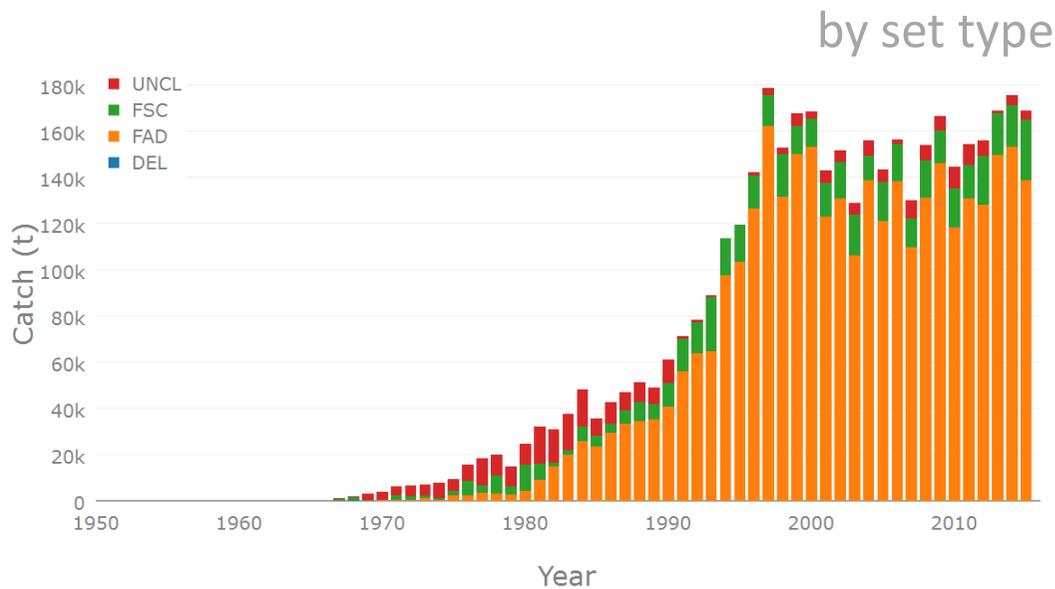
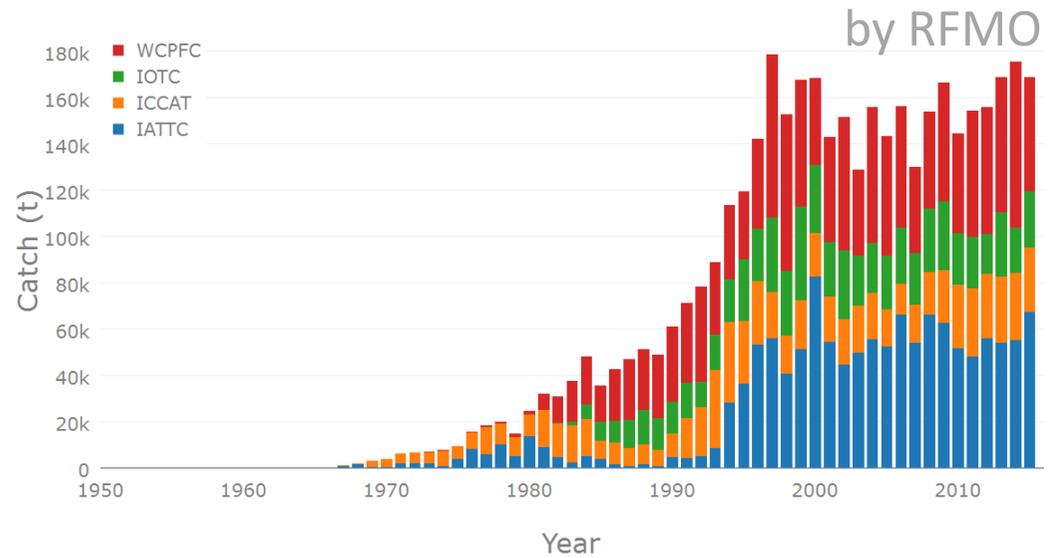
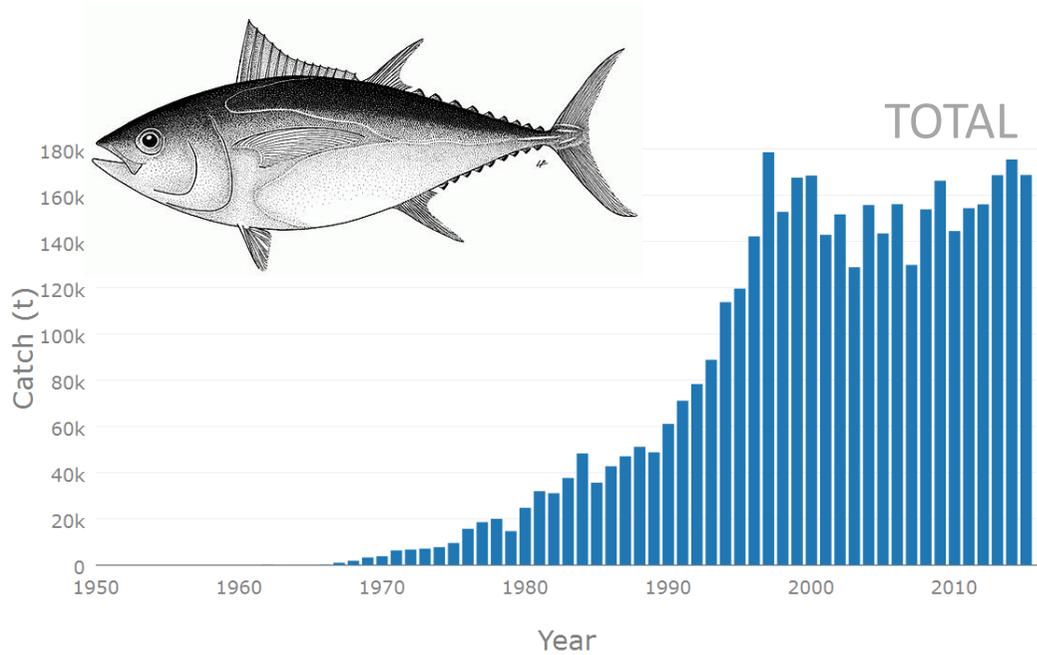
PS-Reported catches by species: SKJ



PS-Reported catches by species: YFT

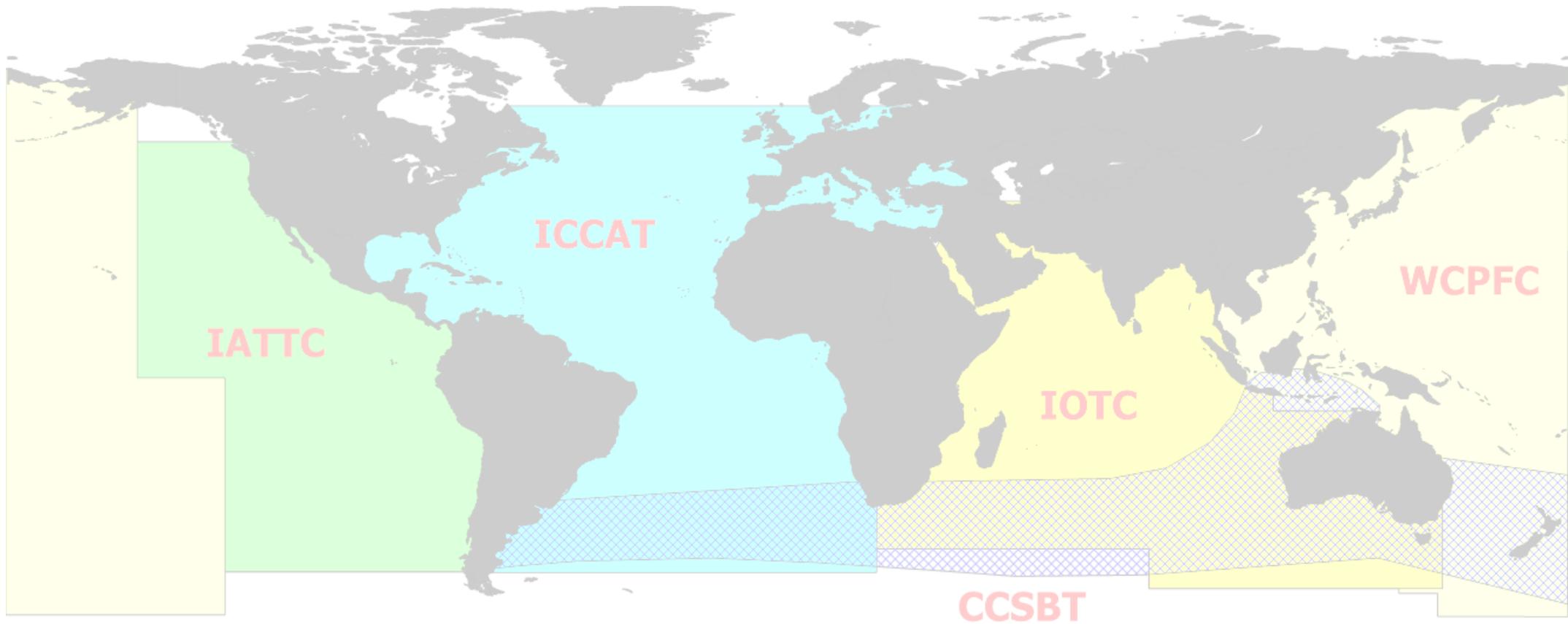


PS-Reported catches by species: BET

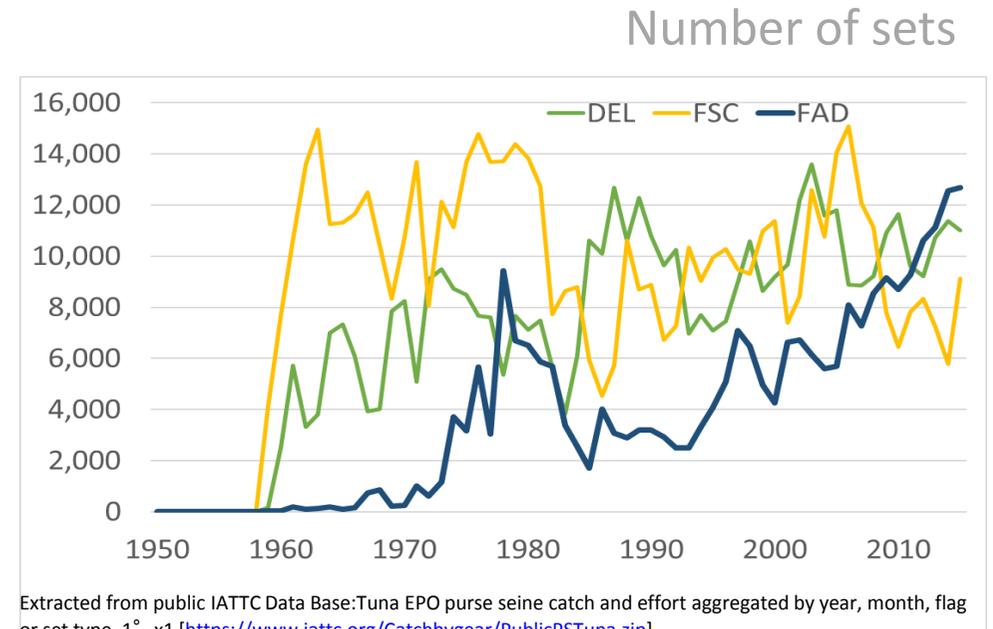
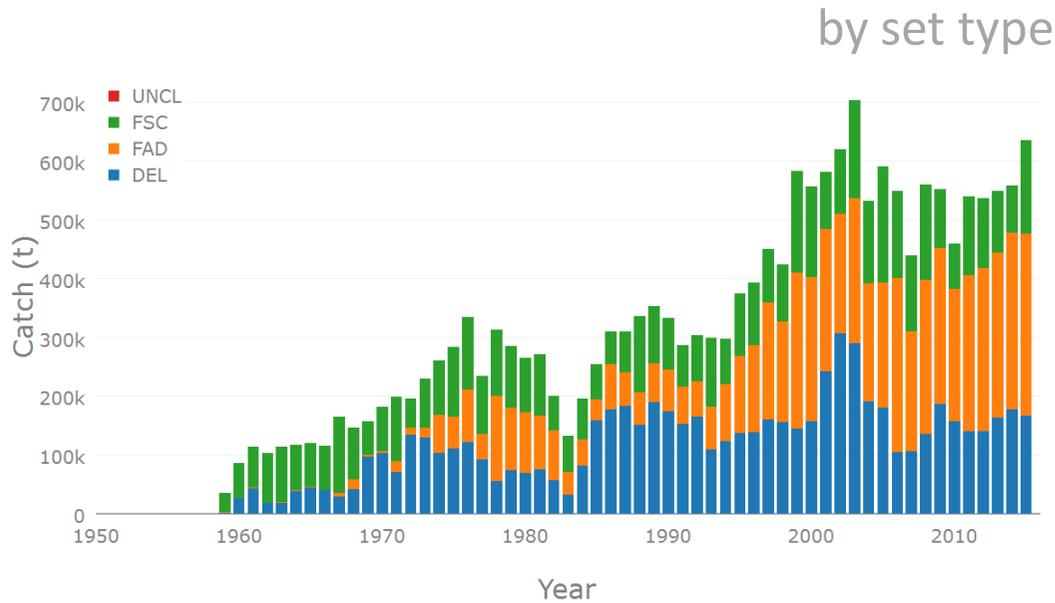
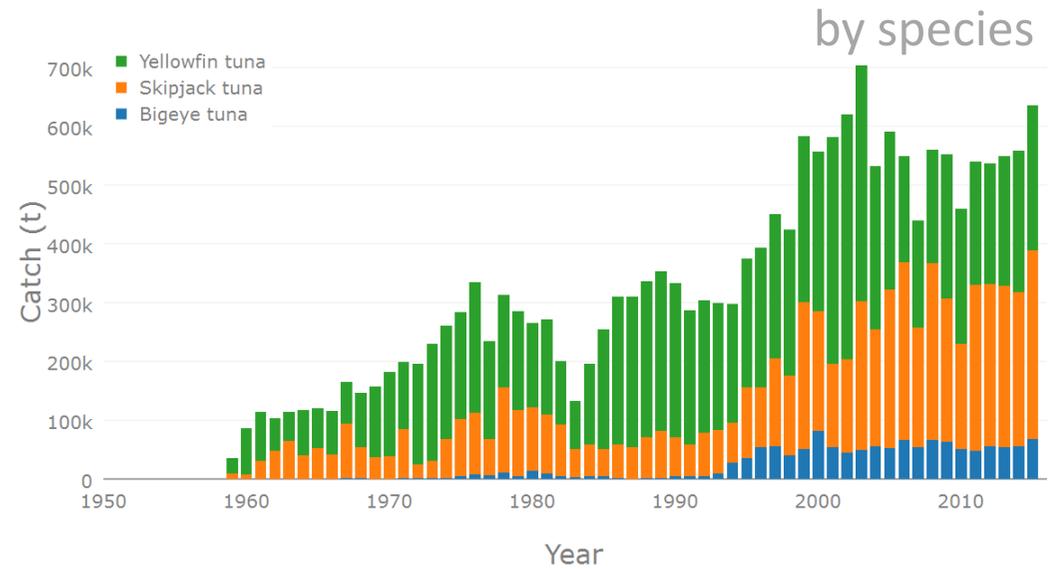
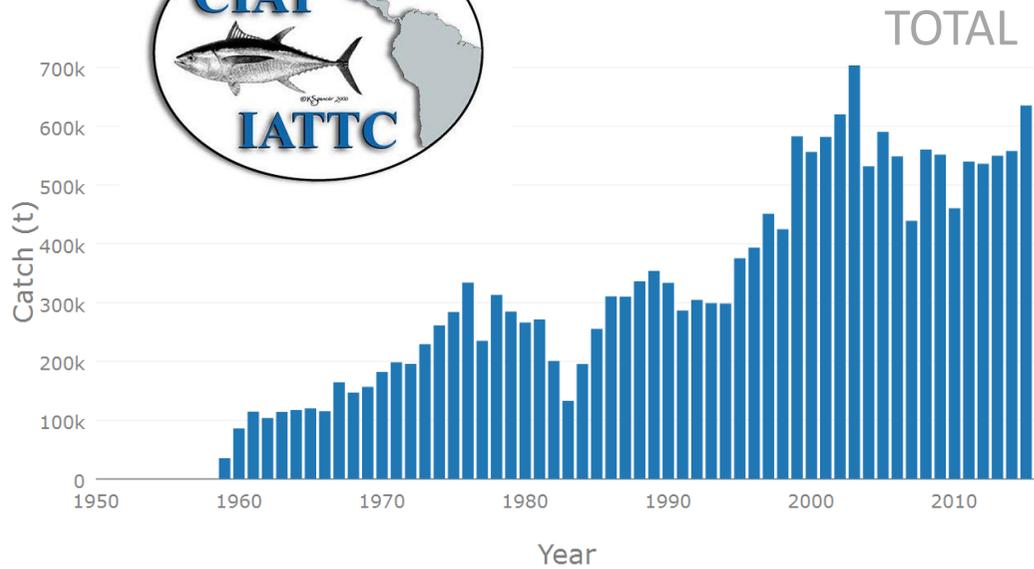


Review of the current state of FAD fisheries

2. Purse seine catch and effort by RFMO

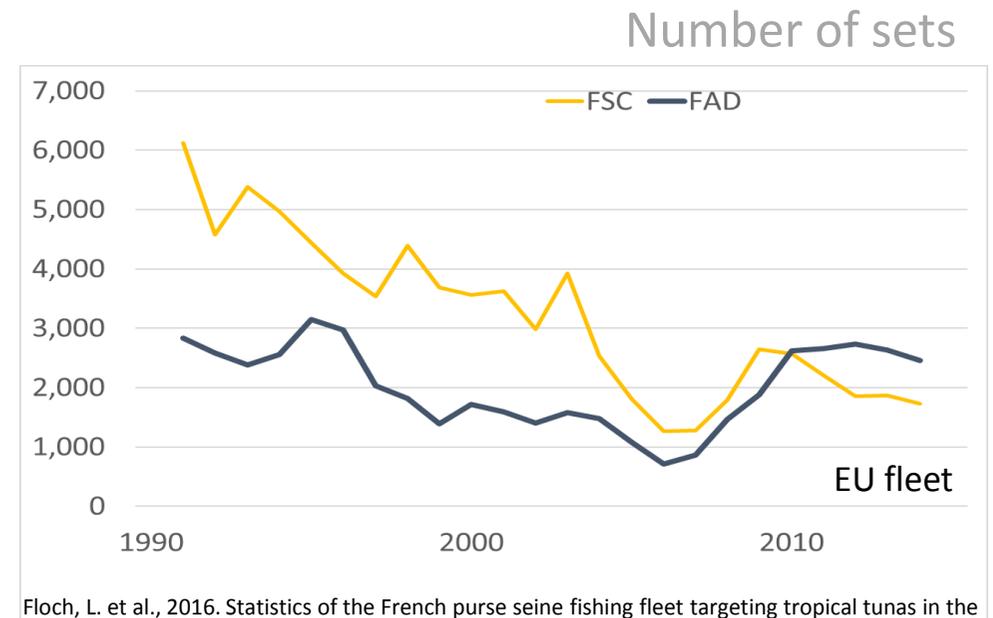
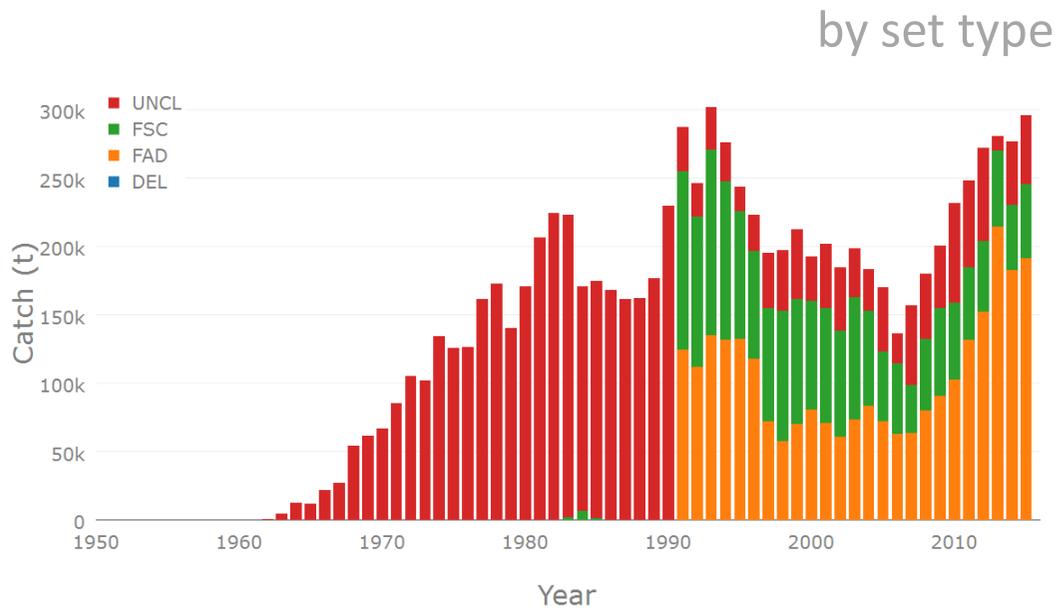
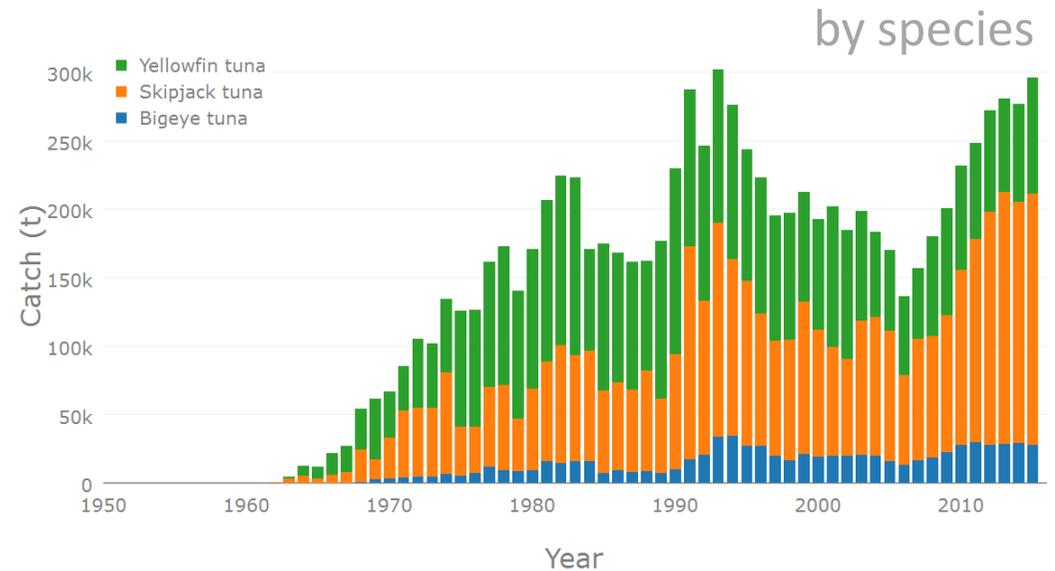
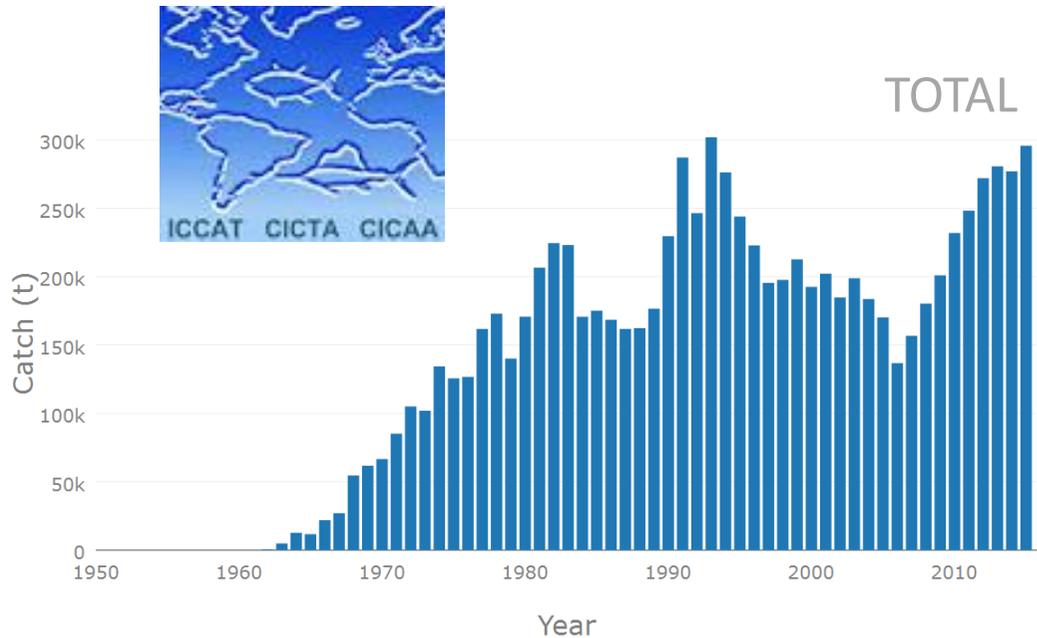


PS-Reported catches and effort by RFMO: IATTC



Extracted from public IATTC Data Base:Tuna EPO purse seine catch and effort aggregated by year, month, flag or set type, 1° x1 [<https://www.iattc.org/Catchbygear/PublicPSTuna.zip>]

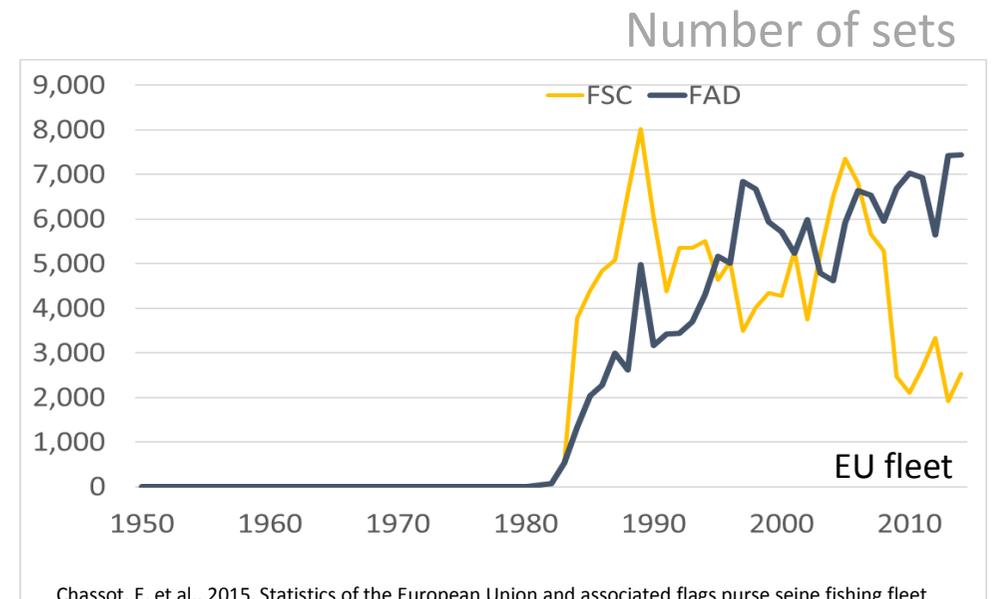
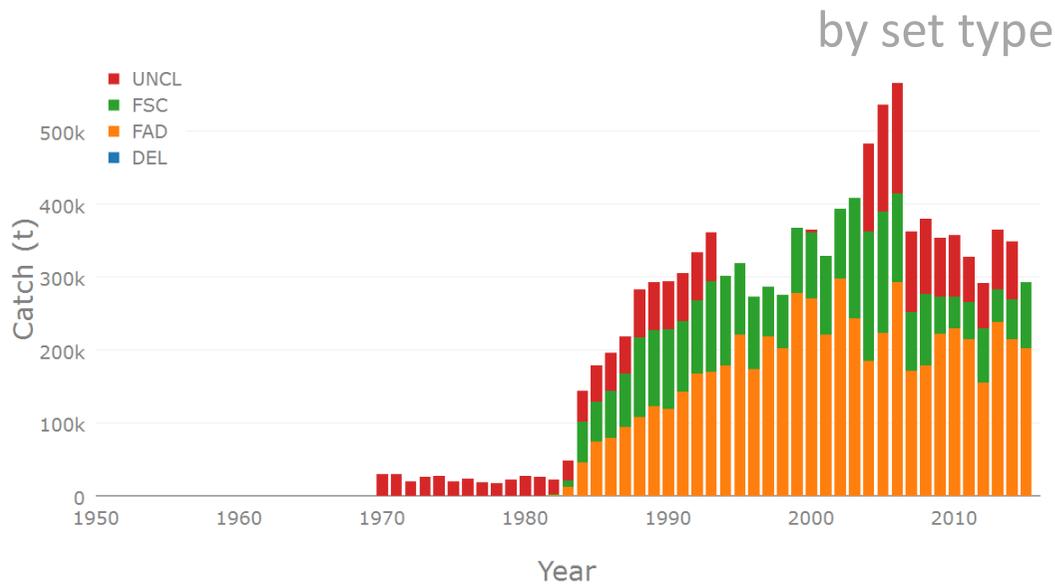
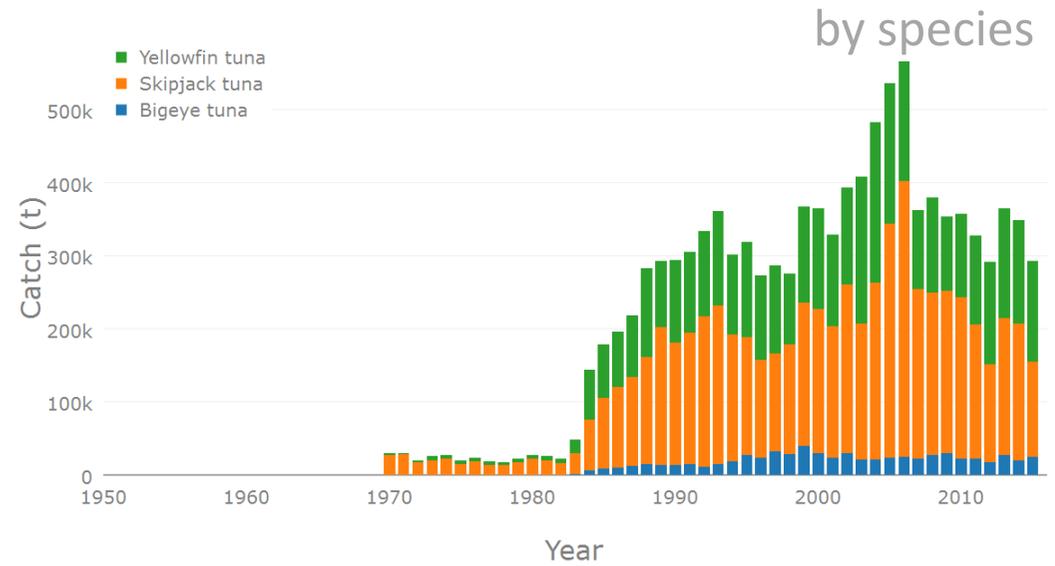
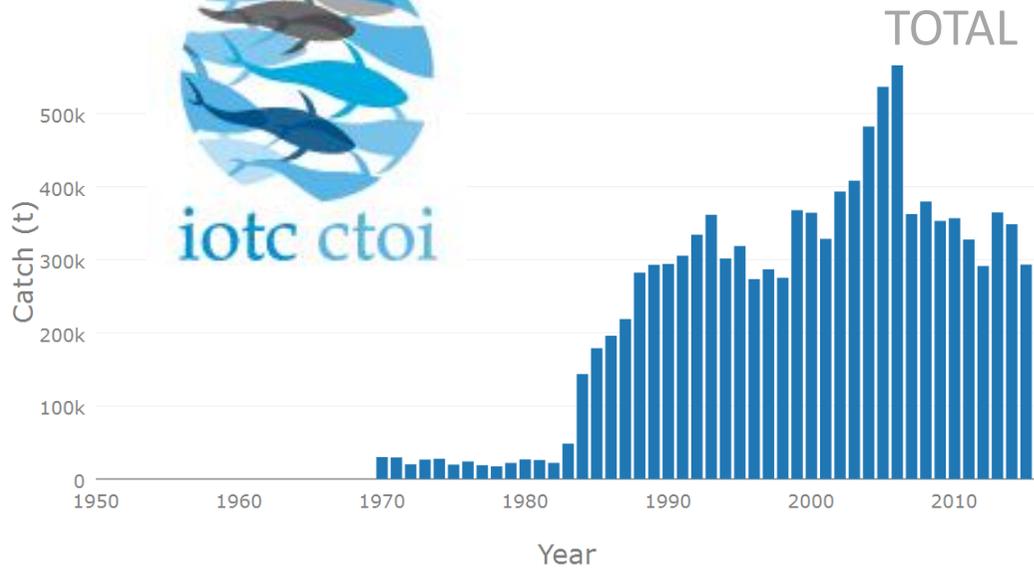
PS-Reported catches and effort by RFMO: ICCAT



Floch, L. et al., 2016. Statistics of the French purse seine fishing fleet targeting tropical tunas in the Atlantic Ocean (1962-2015). SCRS/2016/159

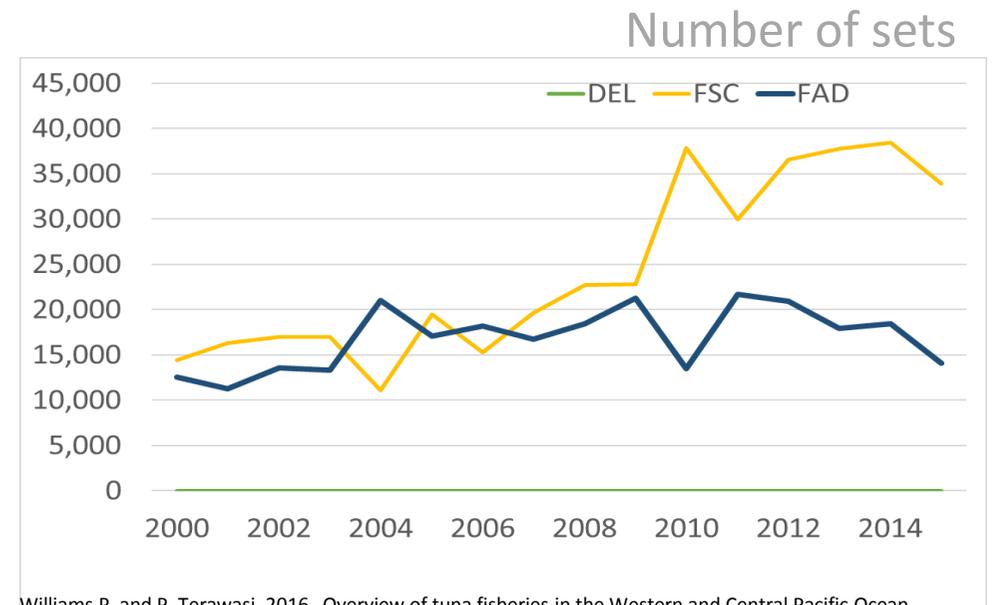
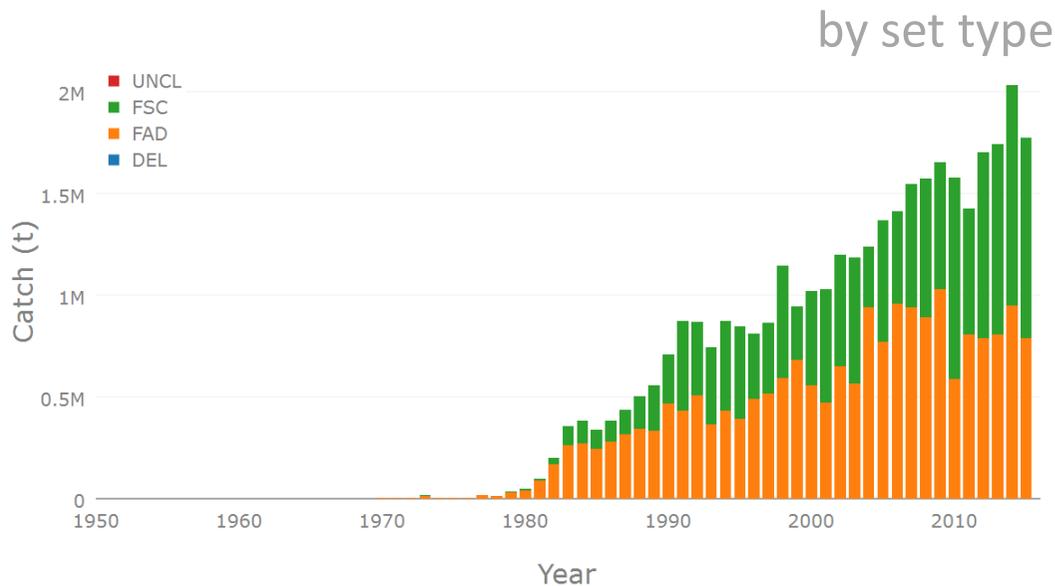
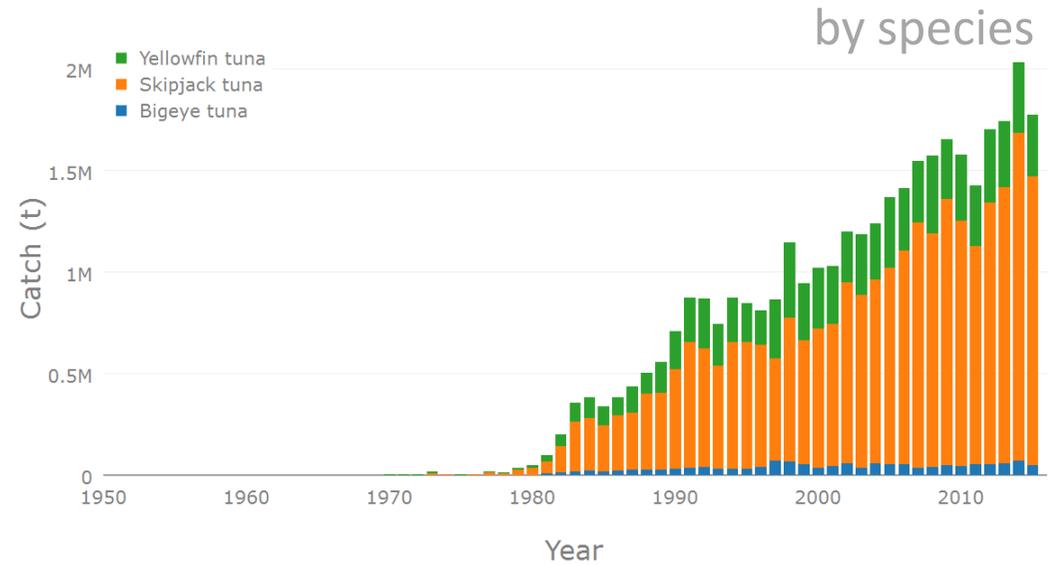
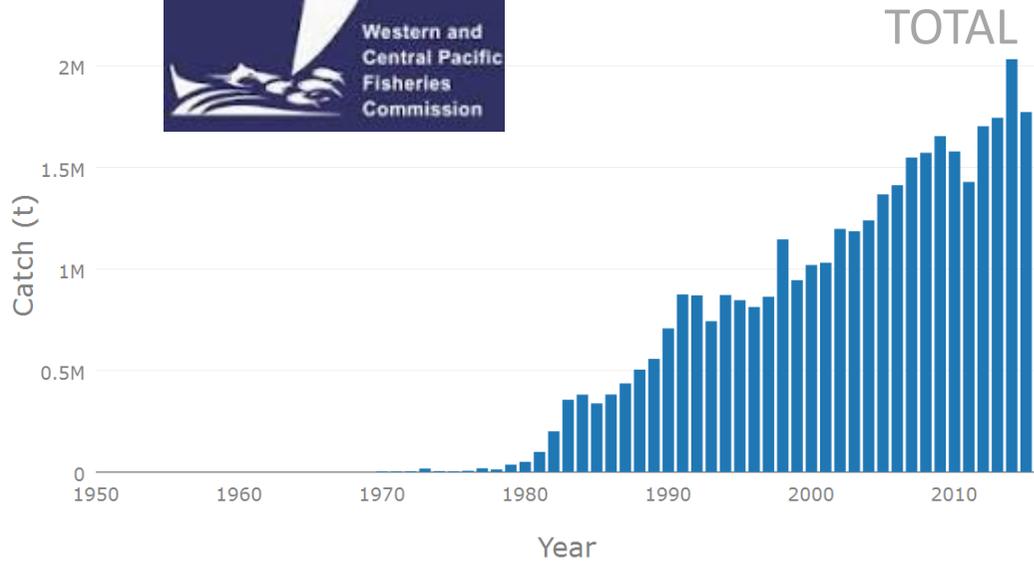
Delgado de Molina, A. et al., 2015. Estadísticas españolas de la pesquería atunera tropical, en el Océano Atlántico, hasta 2014. SCRS/2015/131

PS-Reported catches and effort by RFMO: IOTC



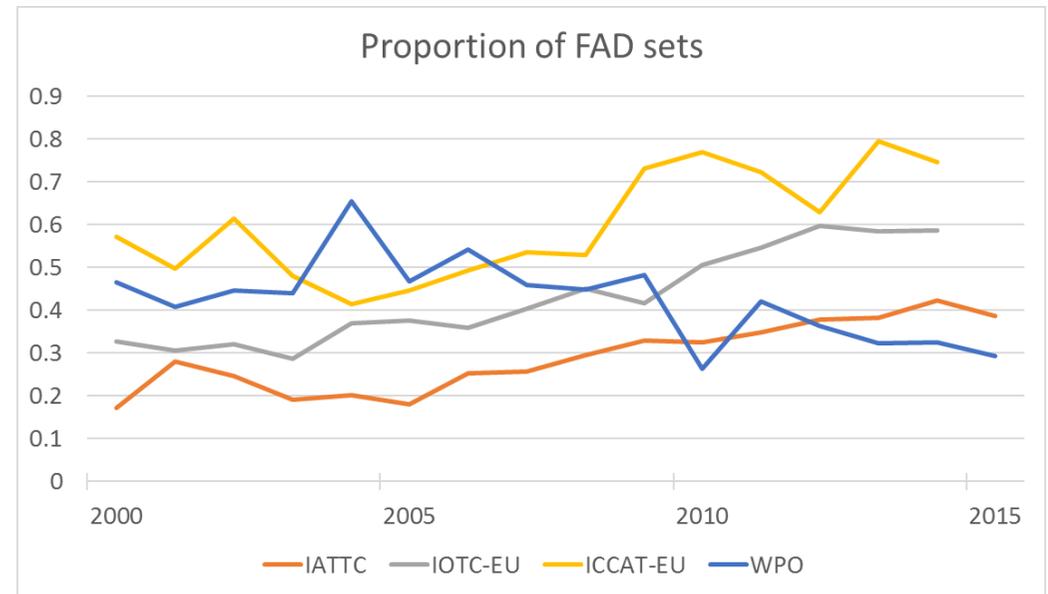
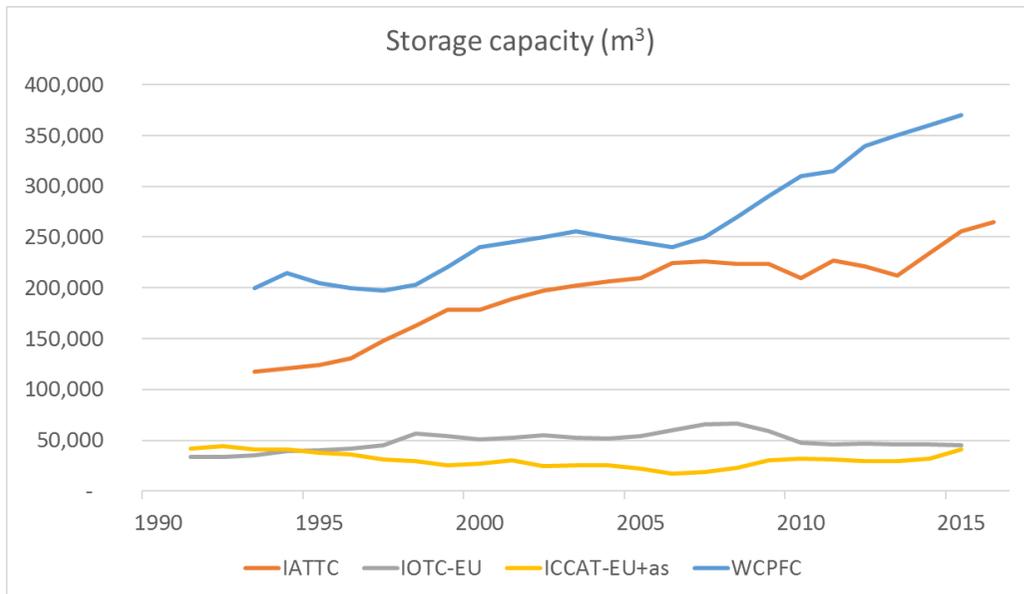
Chassot, E. et al., 2015. Statistics of the European Union and associated flags purse seine fishing fleet targeting tropical tunas in the Indian Ocean 1981-2014. . IOTC-2015-WPTT17-12

PS-Reported catches and effort by RFMO: WCPFC



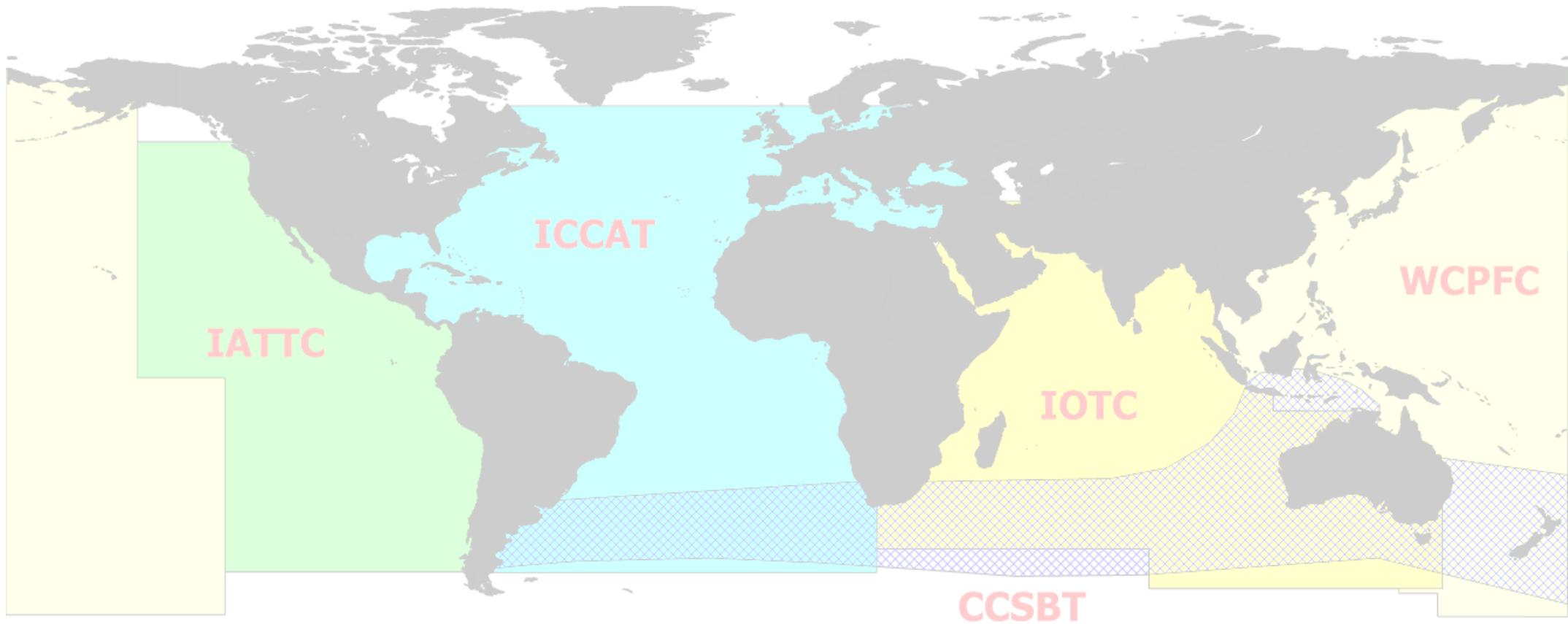
Williams P. and P. Terawasi, 2016. Overview of tuna fisheries in the Western and Central Pacific Ocean, including economic conditions. GN-WP-01. <https://www.wcpfc.int/node/27480>
Table A14. Purse seine tuna effort by set type in the WCPFC Convention Area between 20° N and 20° S, excluding domestic purse seine effort in Philippines, Indonesia and Vietnam

PS-Recent trends in storage capacity and % FAD sets by RFMO



Review of the current state of FAD fisheries

3. Tropical tuna stock status



Tropical Tuna stock status

Different modelling approaches

	Bigeye tuna	Skipjack tuna	Yellowfin tuna
AO	ASPIC, SS3	ASPIC, BSP, Catch-only model	ASPIC, ASPM, SS3, VPA
EPO	SS3	Indicators	SS3
IO	SS3	SS3	SS3
WPO	Multifan CL	Multifan CL	Multifan CL

Different biological parameters – NATURAL MORTALITY

	Bigeye tuna	Skipjack tuna	Yellowfin tuna
AO	0.8 for ages 0 and 1, and 0.4 for ages 2+	M vector decreasing with size (Gaertner, 2014)	0.8 for ages 0 and 1, and 0.6 for ages 2+
EPO	M vector varies with size and sex: Q1-Q4: 0.25 -0.20-0.17-0.13 / FEMALE: >Q4: 0.10 / MALE: Q4-Q15: 0.10; Q16-Q16: 0.11; Q19-Q21: 0.12; Q22-Q24: 0.13; >Q24: 0.14	M = 1.5 yr-1	M vector varies with size and sex: Q1-Q9: 0.70 -0.60-0.50-0.44-0.38-0.32-0.26-0.20- 0.20 / FEMALE: >Q10: 0.23 / MALE: Q10- Q15:0.21- 0.26- 0.32 - 0.38- 0.42- 0.44- 0.46 (2)- 0.47 (6)- 0.48 (4); >Q23: 0.48
IO	Two alternatives: High M for the younger ages and about 0.1 per quarter for the adult age classes / Lower M based on a Lorenz curve with a lower M for the adult ages (0.0625 per quarter)	M grid (0.7, 0.8 and 0.9)	Age-specific. Relative variation amongst ages based on WCPO YFT assessment and overall scale of natural mortality estimated in 2012 IO YFT assessment
WPO	M vector varies with size, with the lower rates of around 0.5 yr-1 for bigeye >40 cm FL	M is substantially larger for small SKJ (21–30 cm FL, M=0.8 mo-1) compared to larger SKJ (51–70 cm FL, M=0.12–0.15 mo-1)	M strongly variable with size, with the lowest rate of around 0.6-0.8 yr-1, being for preadult yellowfin 50-80 cm FL

Tropical Tuna stock status

Different biological parameters – MATURITY

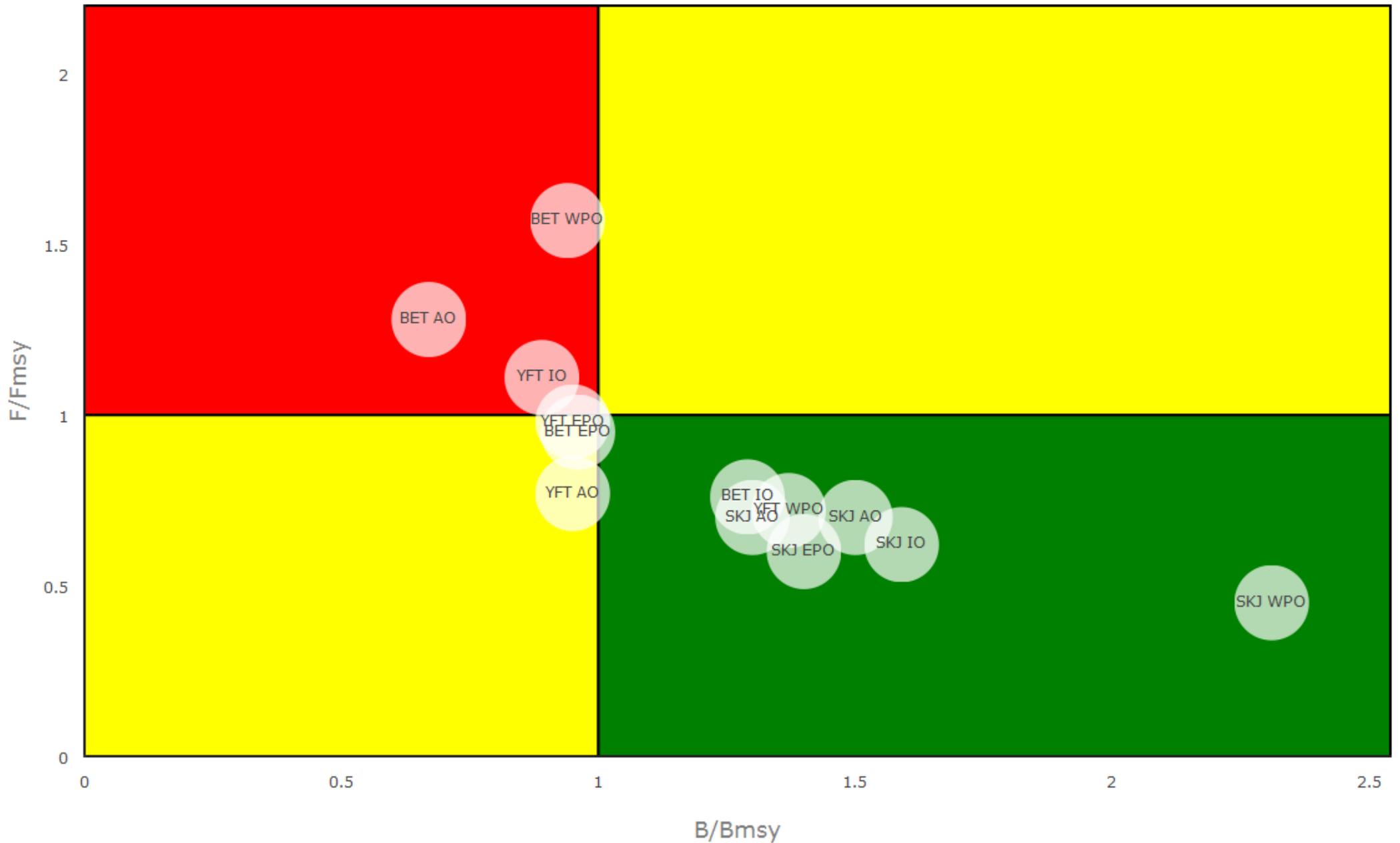
	Bigeye tuna	Skipjack tuna	Yellowfin tuna
AO	100-110 cm - 3 year old	Depending on the areas, between 42 and 50 cm	100 cm - 3 year old
EPO	5 year old (Q17) 50% mature	40-42 cm	70-80 cm
IO	100 cm - 3 year old	41-43 cm <2 year old	60-70 cm
WPO	100 cm FL [100% of individuals >120 cm FL are reproductively mature]	Around 40 cm FL	100 cm - 2 year old

Different biological parameters – STEEPNESS

	Bigeye tuna	Skipjack tuna	Yellowfin tuna
AO	0.7 - 0.8 - 0.9	-	0.9
EPO	1	-	1
IO	0.7 - 0.8 - 0.9	0.7 - 0.8 - 0.9	0.8
WPO	0.8	0.8	0.8

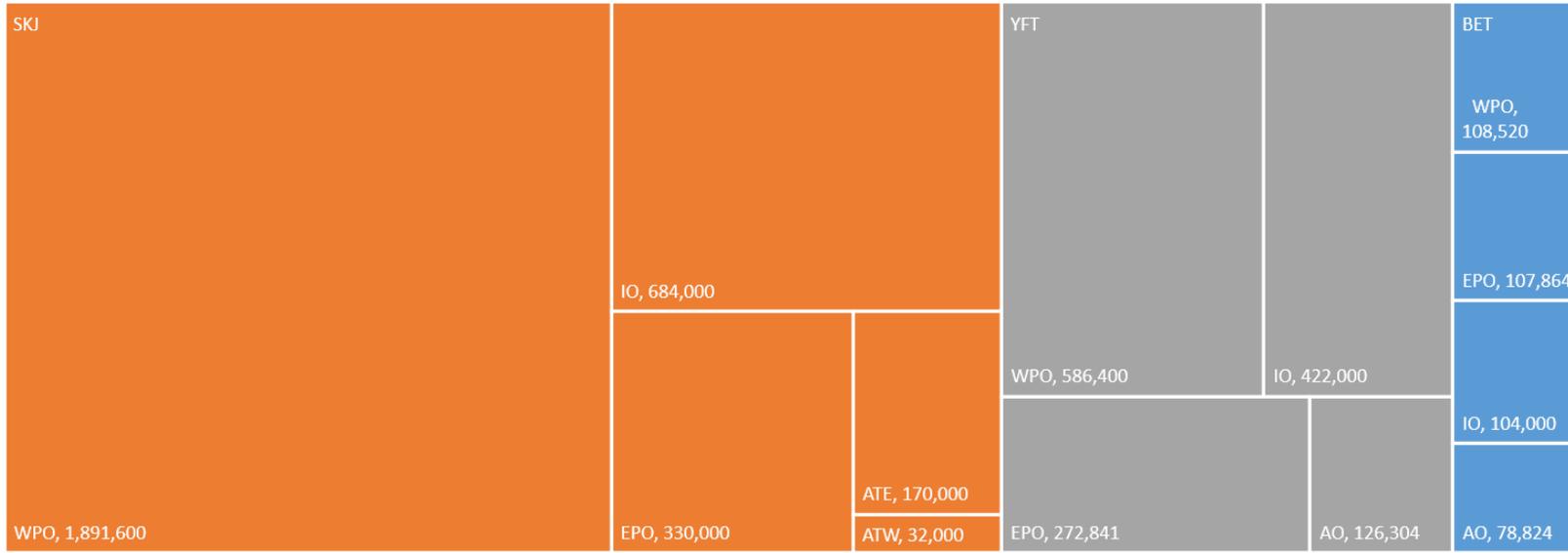
Tropical Tuna stock status

Kobe plot

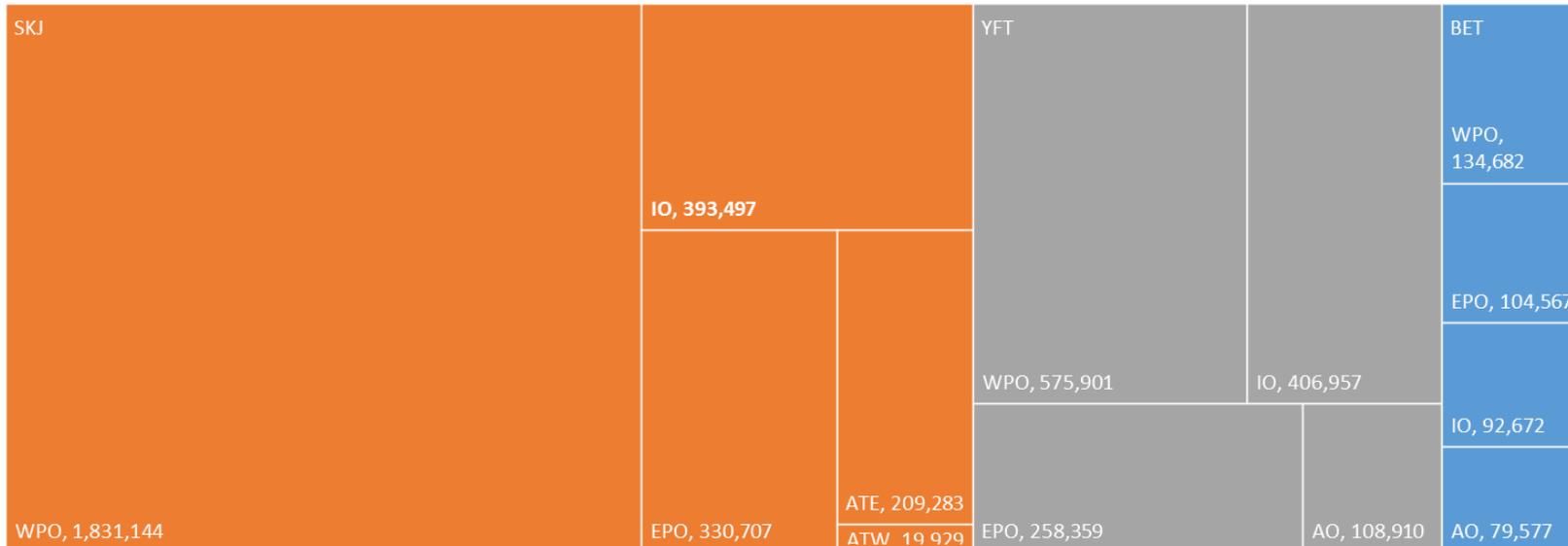


Tropical Tuna stock status

MSY = 4,9 10⁶ MT [4.4 - 5.7 MT]

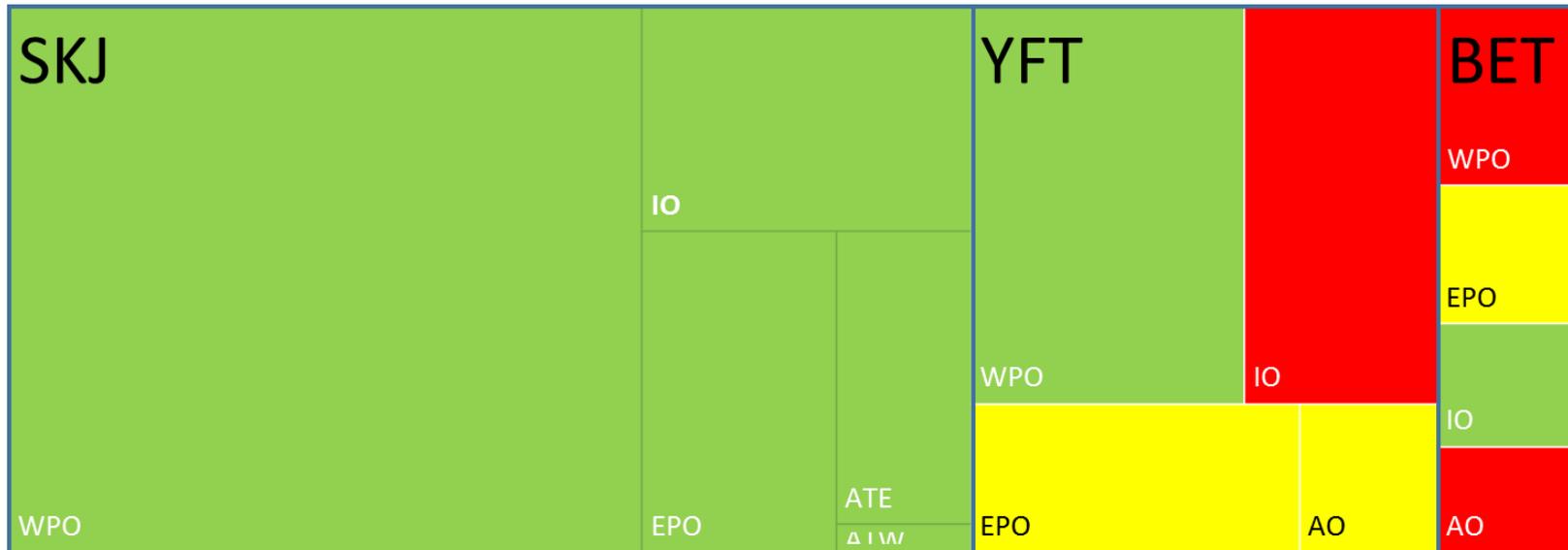


2015 TT CATCHES = 4.5 10⁶ MT



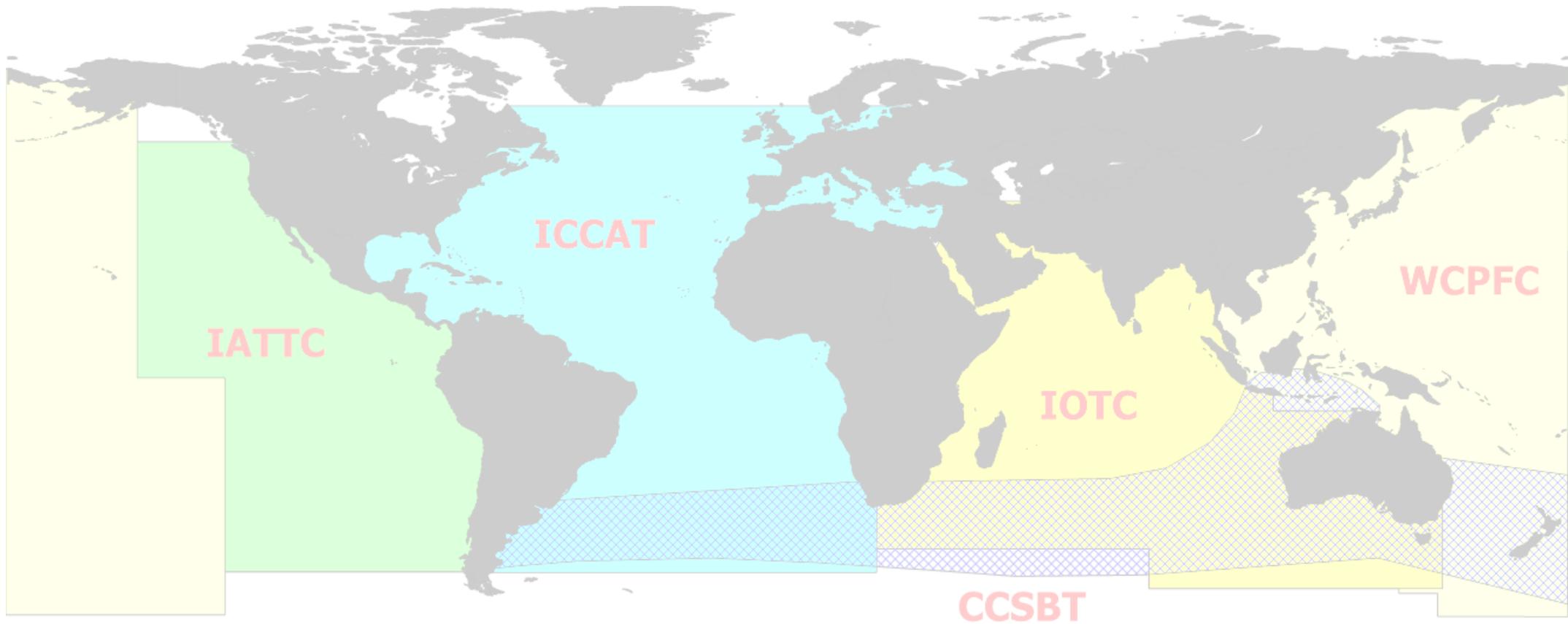
Tropical Tuna stock status

2015 TT CATCHES = 4.5 10⁶ MT



Review of the current state of FAD fisheries

4. FAD management measures



FAD management measures

- + Measures implemented
- Measures not implemented

	WCPFC	IATTC	ICCAT	IOTC	CCSBT
FAD closure	+	+	+	-	
FAD set limits	+	-	-	-	
FAD design	-	-	+	+	
FAD number limits	-	-	+	+	
Supply/tender vessel limits	-	+	-	+	

Tropical Tuna app

