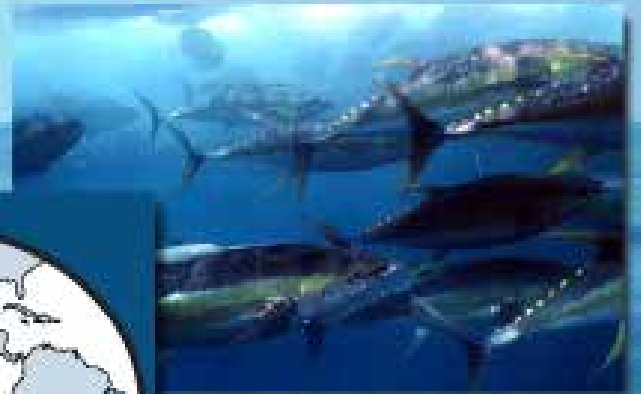


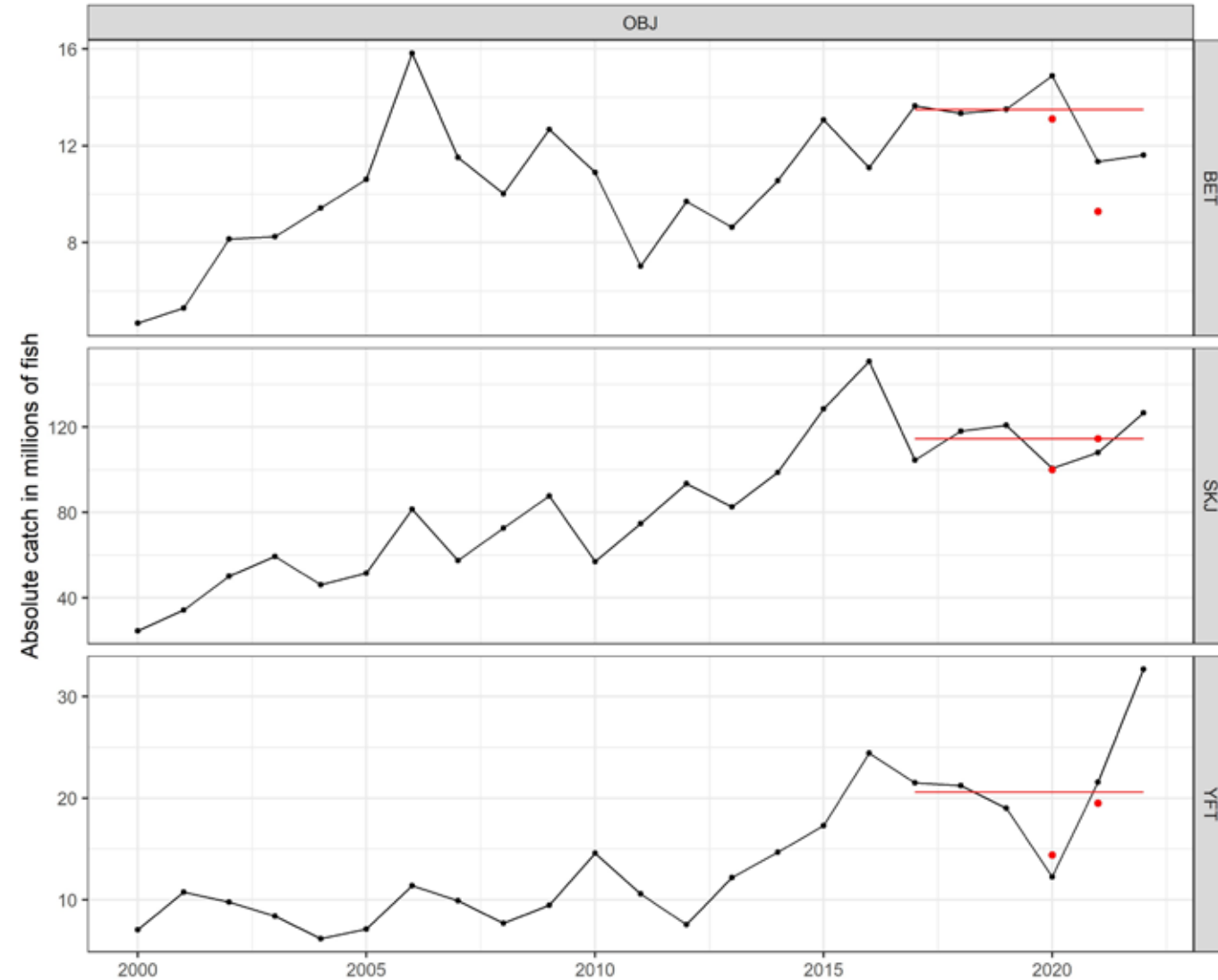
Comisión Interamericana del Atún Tropical
Inter-American Tropical Tuna Commission



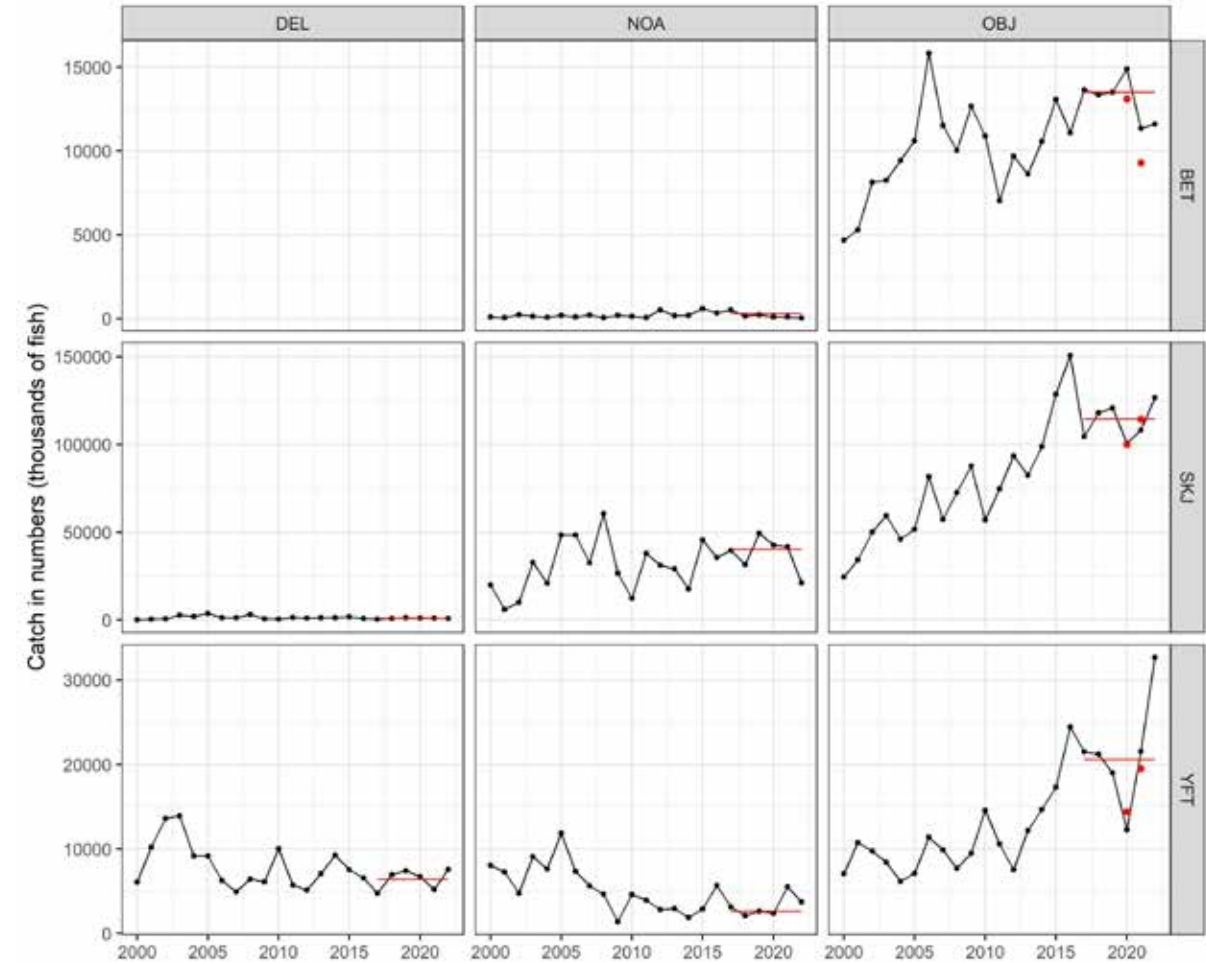
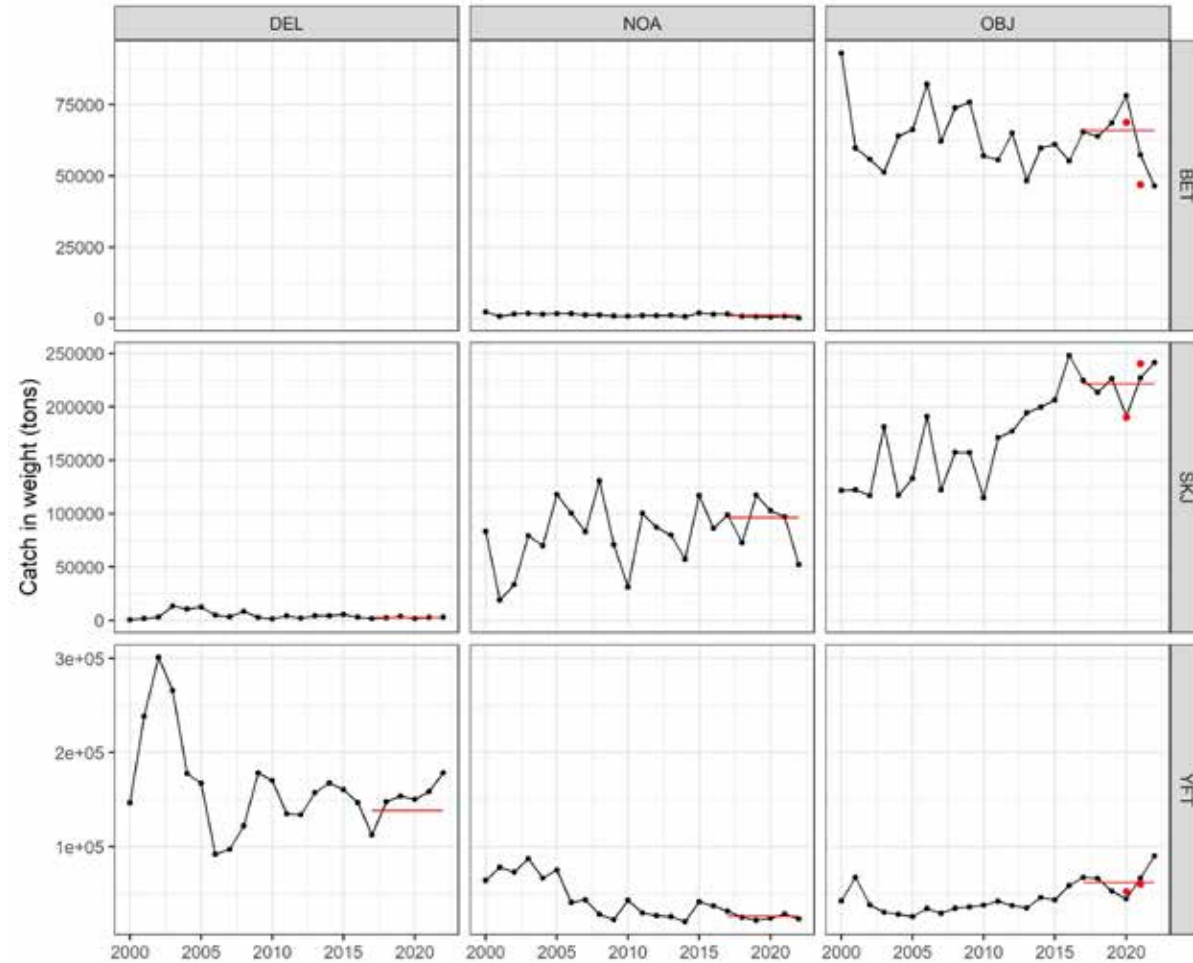
Staff's responses to requests

101ª Reunión de la CIAT – 101th Meeting of the IATTC
7 - 11 Ago- 7-11 Aug 2023 - Victoria, B.C., Canada

Q1 VEN: OBJ catches in numbers (YFT, SKJ, BET)



Q1 VEN: Purse-seine catches in numbers (YFT, SKJ, BET)



Q2 COL/GTM: Staff views on Proposal E1

- Review on contents of the proposal
 - Proposal introduces interim proxy reference points (RP) for species where C-16-02 reference points cannot be reliably estimated.
 - Proxy target RP related to 0.3 SBR (more conservative than those in C-16-02).

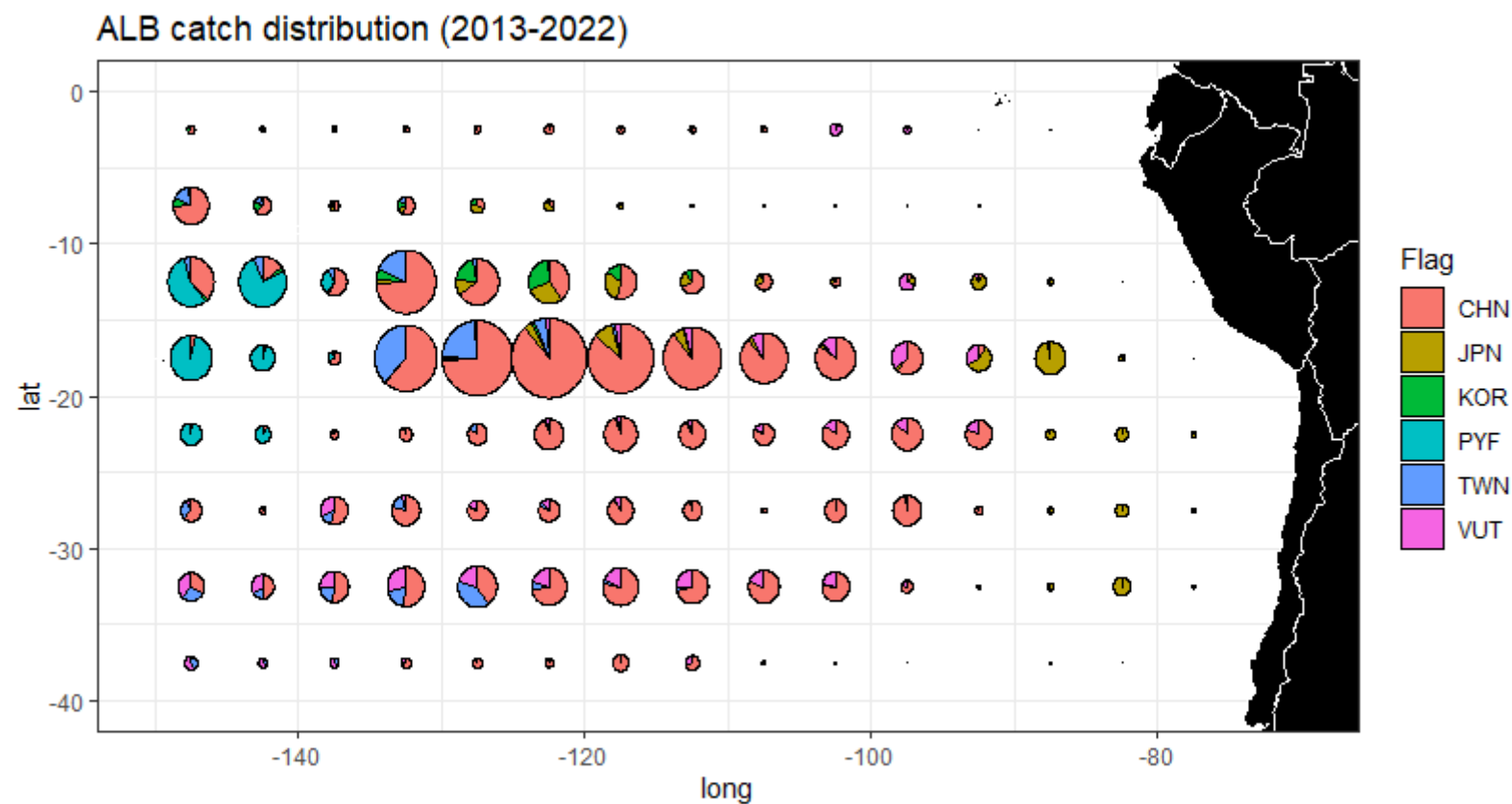
$B_{\text{target}} = 0.3$

SAC-14-09

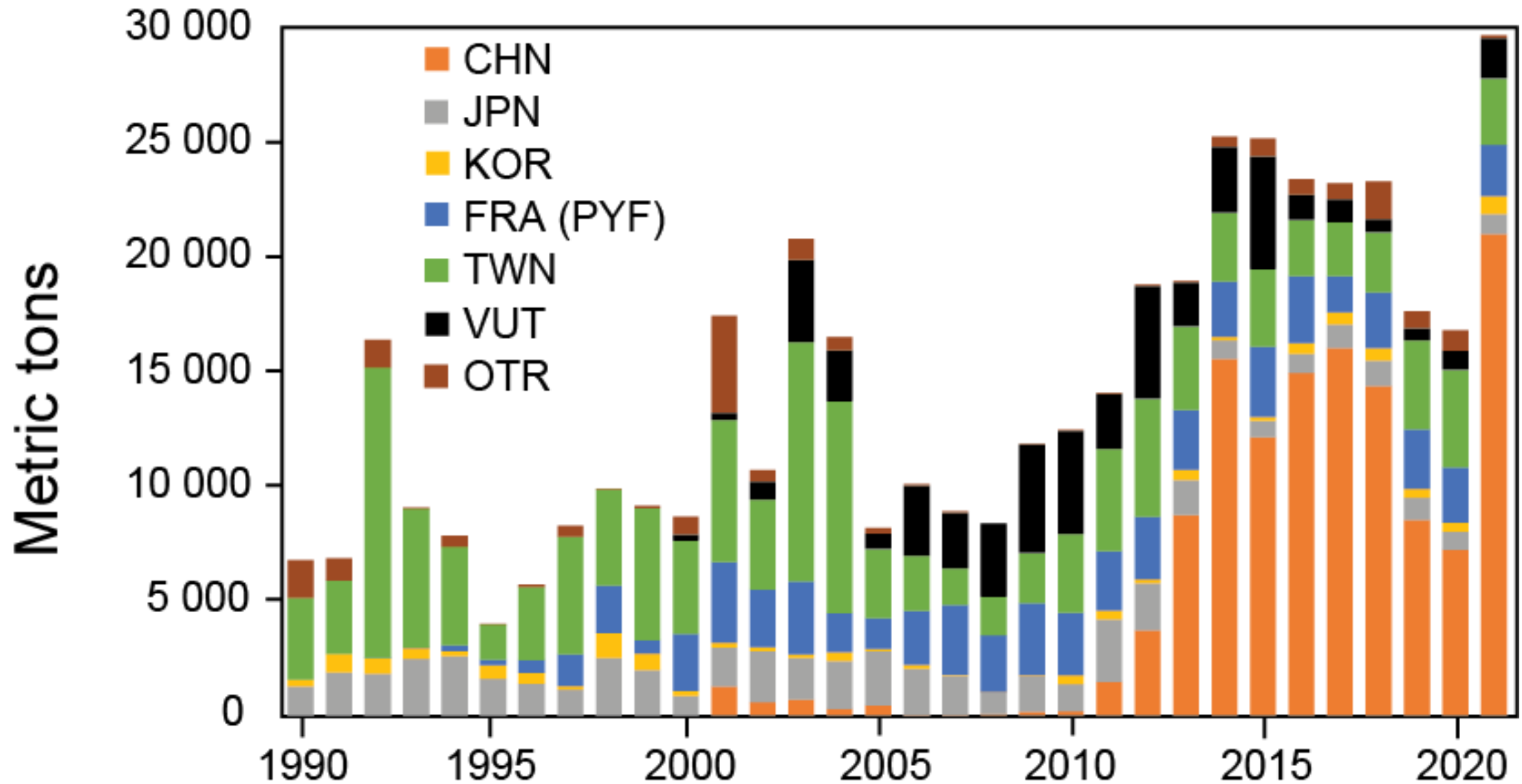
Steepness (h)	Bigeye	Yellowfin
1.0	0.20 – 0.24	0.23 – 0.32
0.9	0.25 – 0.27	0.28 – 0.35
0.8	0.28 – 0.30	0.32 – 0.37
0.7	0.31 – 0.32	0.35 – 0.40

- How does the proposal integrate with MSE work and BET HS for 2024
 - Ongoing MSE work focus on BET, proxy reference points from proposal E1 could be incorporated into ongoing and future MSE work into other species HSs.

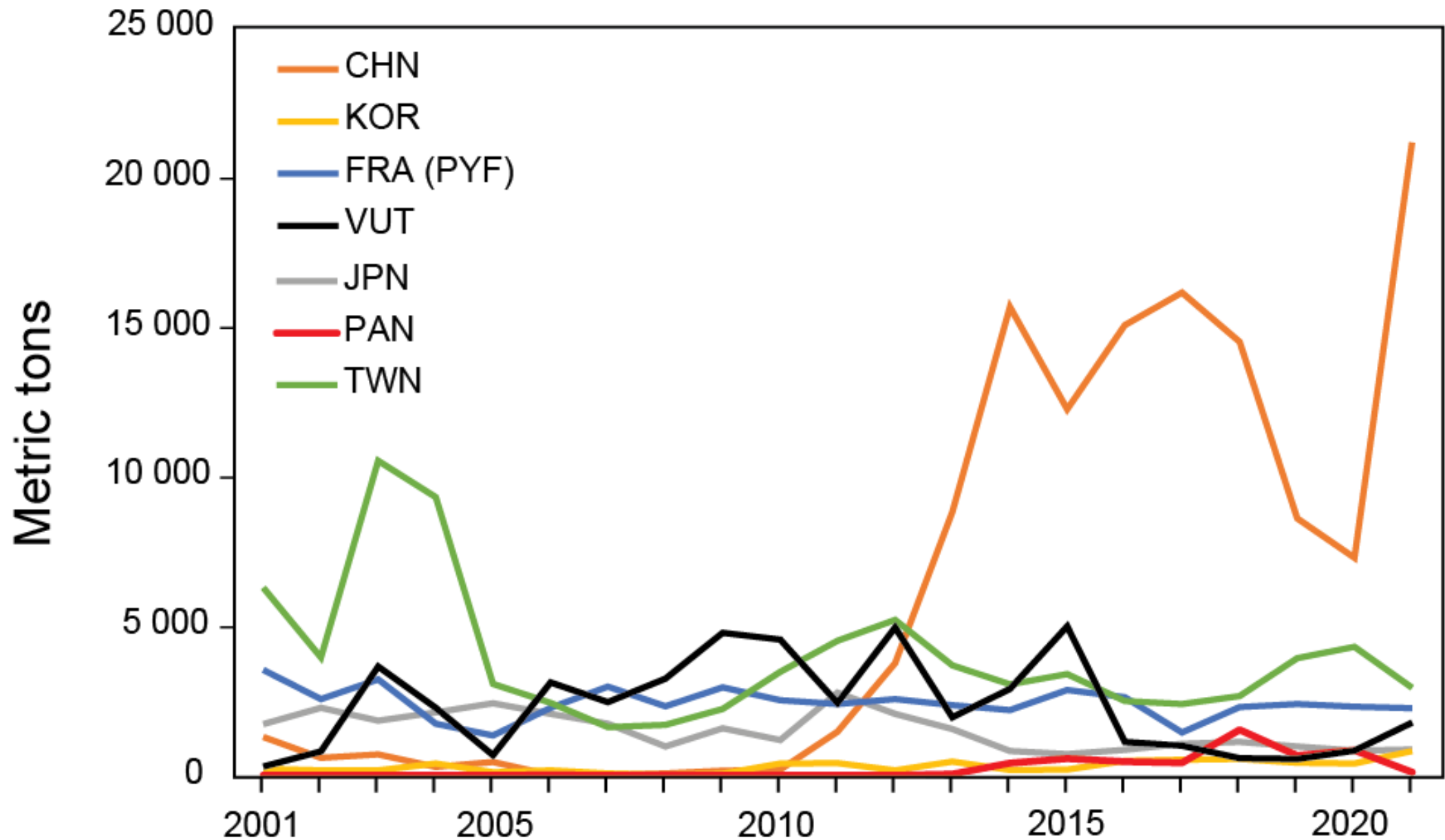
Q3 JPN: S-ALB LL catch distribution by CPC



Q3 JPN: S-ALB catches by CPC for All Gears (South of 10S)



Q3 JPN: S-ALB LL catches by CPC (South of 10S)

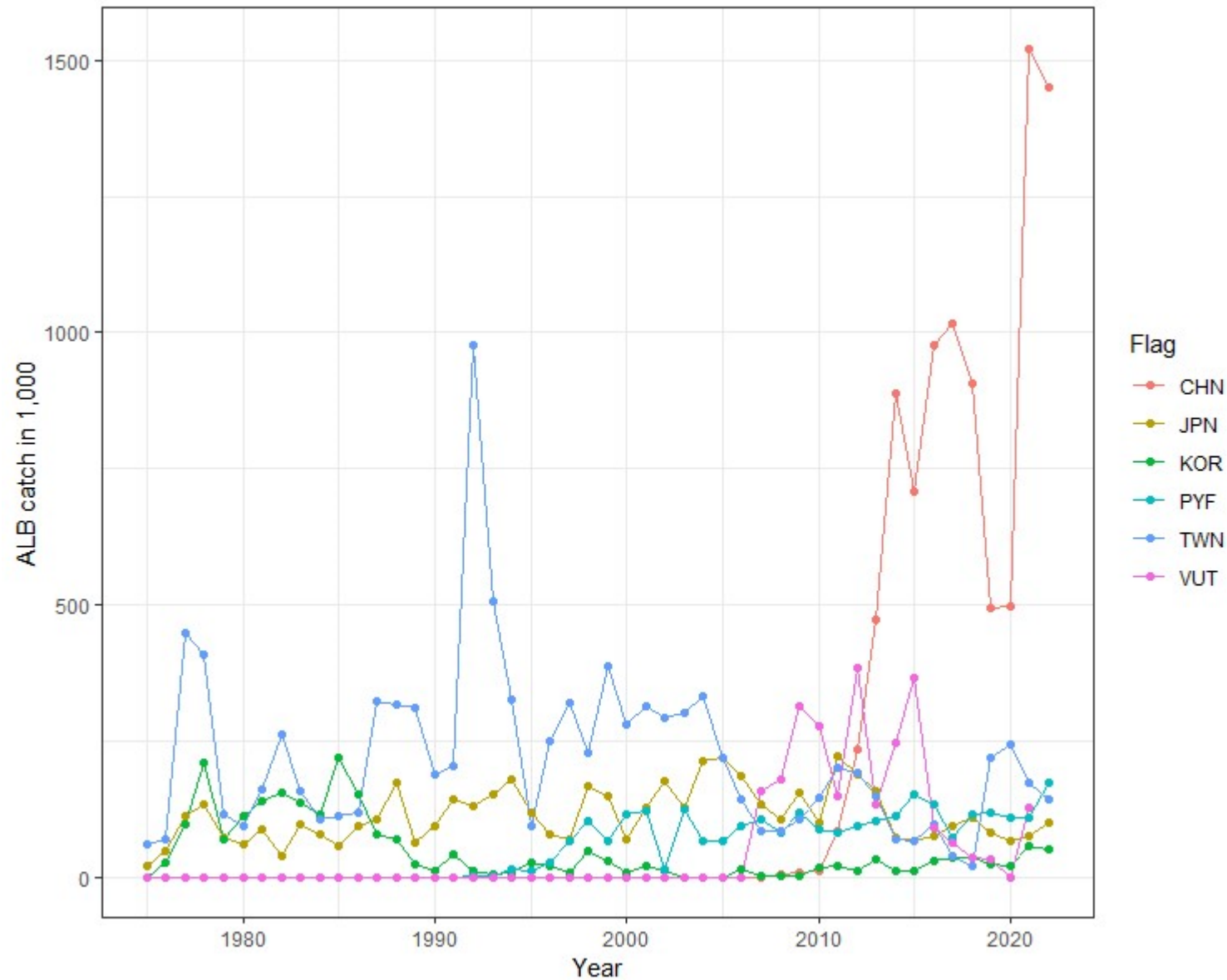


Q3 JPN: S-ALB LL catches by CPC (South of 10S)

In metric tons

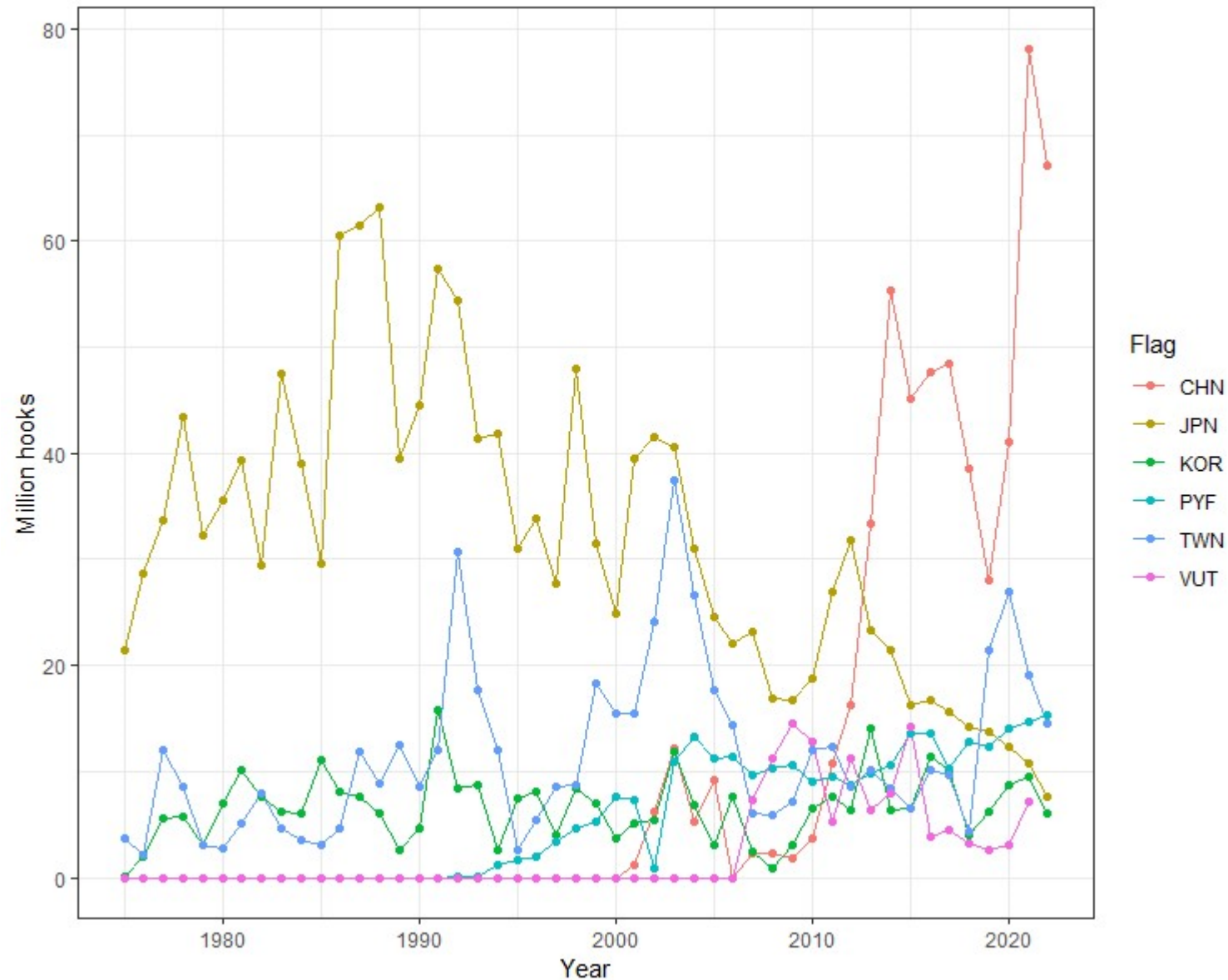
<u>Year</u>	<u>CHN</u>	<u>JPN</u>	<u>KOR</u>	<u>PAN</u>	<u>PYF</u>	<u>TWN</u>	<u>VUT</u>
2,001	1,276	1,713	220	2	3,524	6,273	294
2,002	586	2,252	161	-	2,545	3,937	794
2,003	694	1,827	162	6	3,200	10,519	3,640
2,004	278	2,104	397	2	1,724	9,302	2,249
2,005	440	2,407	101	5	1,329	3,050	666
2,006	10	2,050	165	7	2,254	2,415	3,098
2,007	12	1,729	61	-	2,962	1,604	2,444
2,008	68	969	19	-	2,301	1,680	3,236
2,009	152	1,566	57	-	2,937	2,221	4,759
2,010	190	1,181	396	-	2,508	3,463	4,537
2,011	1,462	2,756	404	-	2,384	4,503	2,415
2,012	3,753	2,053	168	-	2,551	5,192	4,941
2,013	8,809	1,548	452	33	2,342	3,672	1,938
2,014	15,659	815	181	408	2,173	3,034	2,885
2,015	12,240	710	184	553	2,856	3,384	4,978
2,016	15,052	851	484	450	2,612	2,485	1,118
2,017	16,136	1,052	521	412	1,430	2,378	987
2,018	14,487	1,116	545	1,522	2,285	2,650	570
2,019	8,592	968	418	653	2,382	3,918	547
2,020	7,267	824	392	841	2,295	4,300	819
2,021	21,153	858	816	97	2,240	2,929	1,758

Q3 JPN: S-ALB LL catch (thousands of fish) by CPC (South of 10°S)



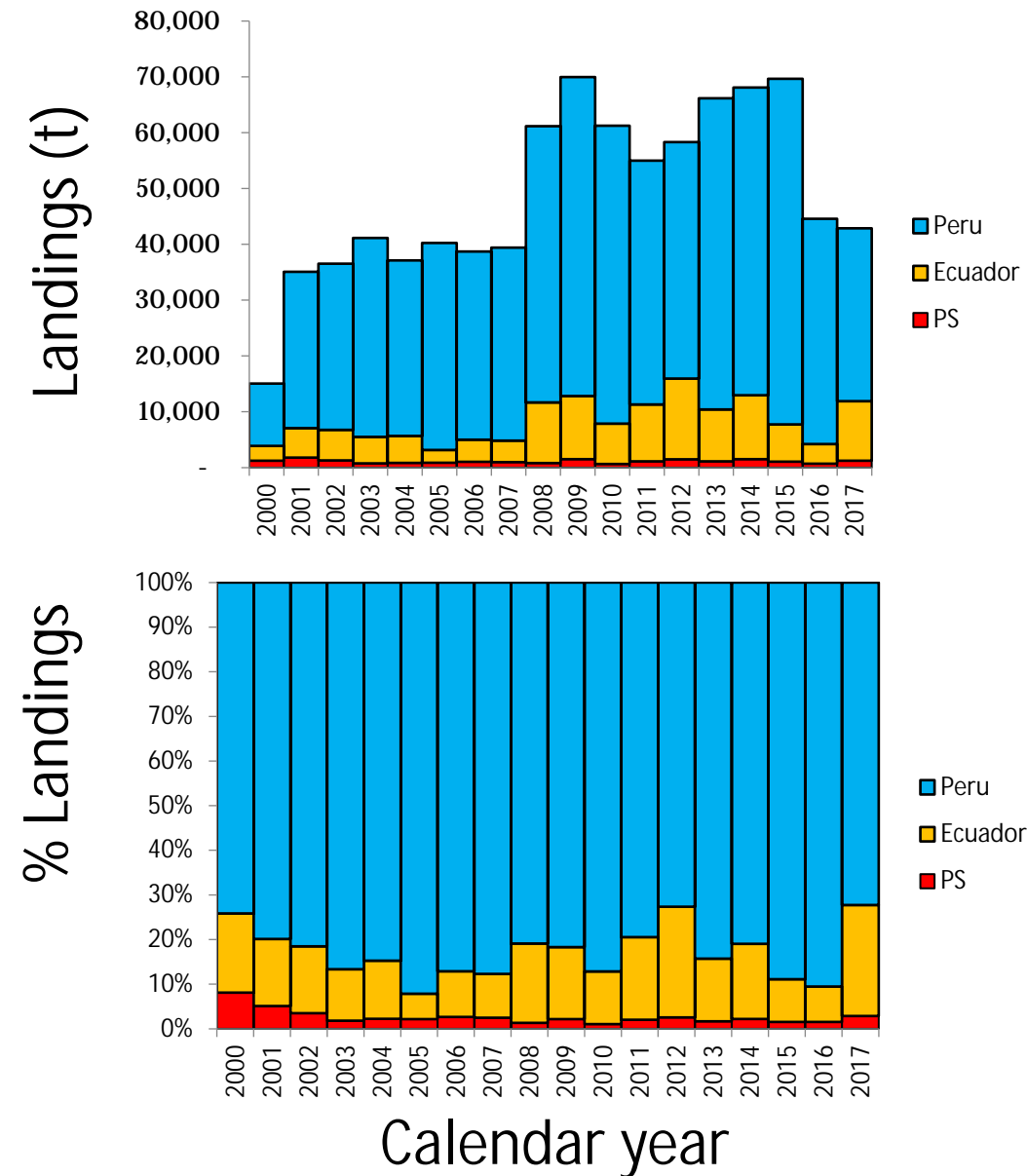
Year	CHN	JPN	KOR	PYF	TWN	VUT
2001	0	126	20	122	313	0
2002	0	175	11	15	292	0
2003	0	128	0	124	302	0
2004	0	213	0	65	332	0
2005	0	218	0	66	219	0
2006	0	184	13	93	142	0
2007	0	132	3	106	83	157
2008	4	105	1	81	83	179
2009	9	155	3	117	104	313
2010	11	100	16	88	144	276
2011	85	221	20	83	201	148
2012	234	188	10	94	190	383
2013	473	158	31	104	150	133
2014	889	73	12	112	70	247
2015	707	66	12	151	67	365
2016	978	76	30	134	96	89
2017	1017	94	34	71	38	64
2018	908	108	35	116	20	34
2019	493	81	22	118	218	32
2020	497	65	21	110	242	0
2021	1522	75	55	108	173	128
2022	1450	99	49	174	141	NA

Q3 JPN: S-ALB LL effort by CPC (south of 10°S)



Year	CHN	JPN	KOR	PYF	TWN	VUT
2001	1.2	39.5	5.1	7.4	15.4	0.0
2002	6.3	41.6	5.5	0.9	24.2	0.0
2003	12.1	40.6	11.9	11.0	37.5	0.0
2004	5.2	31.0	6.9	13.2	26.6	0.0
2005	9.2	24.5	3.1	11.2	17.6	0.0
2006	0.0	22.0	7.6	11.4	14.4	0.0
2007	2.3	23.2	2.4	9.7	6.1	7.3
2008	2.2	17.0	0.9	10.2	5.9	11.2
2009	1.8	16.8	3.1	10.7	7.1	14.5
2010	3.8	18.8	6.5	9.0	12.0	12.8
2011	10.7	26.9	7.6	9.5	12.4	5.3
2012	16.2	31.9	6.4	8.8	8.6	11.3
2013	33.3	23.3	14.0	9.8	10.2	6.4
2014	55.4	21.4	6.4	10.5	8.4	7.9
2015	45.2	16.2	6.5	13.7	6.5	14.2
2016	47.7	16.7	11.4	13.6	10.1	3.8
2017	48.5	15.6	10.2	10.3	9.7	4.5
2018	38.6	14.2	4.0	12.7	4.4	3.2
2019	28.0	13.8	6.2	12.3	21.5	2.6
2020	41.0	12.3	8.7	14.1	26.9	3.0
2021	78.2	10.7	9.5	14.6	19.0	7.2
2022	67.1	7.6	6.0	15.3	14.5	NA

Q4 EU: Dorado catches by PS compared to ECU and PER



Catches from south of 5N

Catches after 2017 and catches North of 5N not available for all CPCs

Average total catch (2000 to 2017) = 48905t

Average catch by source (2000 to 2017)

Peru 40644t (83%)

Ecuador 7154t (15%)

PS 1107t (2%)

Sources: (Data is not final and may have been revised from the time it was provided by CPCs)
Peru: Ministry of Production (PRODUCE)
Ecuador: Undersecretariat of Fisheries Resources; (SRP) and National Fisheries Institute (INP)
PS: IATTC database

Q5 COL/US/CHI: Update on items 5-8 on C-21-06

5. CPCs that allow retention of silky sharks by their longline vessels, shall ensure compliance with the measures established in paragraphs 3 and 4 by means of control and inspection mechanisms, for Port CPCs and Flag CPCs, as applicable. At a minimum, such mechanisms shall require effective inspections at the time of first unloading in port or the submission of catch logbooks that will allow for species identification, verification of size when caught, and enforcement of applicable sanctions such as prevention of entry into markets of product caught in violation of this measure. Where applicable, internationally recognized certification and reporting procedures for the conservation of silky sharks may be used for fulfilling the obligations of this paragraph. CPCs shall inform the IATTC Secretariat of the use of said certification procedures. Data derived from these control and inspection measures shall be communicated to the Secretariat, in accordance with IATTC data submission requirements.
6. The IATTC scientific staff shall indicate to the Scientific Advisory Committee (SAC) the geographical location of the silky shark pupping areas in the Convention Area. CPCs shall require vessels to not fish in silky shark pupping areas, as may be adopted by the Commission, in accordance with the recommendation of the IATTC scientific staff, in coordination with the SAC.
7. For those multi-species fisheries using surface longlines that have captured more than 20% of silky sharks in weight on average in a year, CPCs shall prohibit the use of steel leaders during a period of three consecutive months each year. The average proportion of silky sharks in the catch will be calculated from data of the previous calendar year. New vessels entering the multi-species fisheries affected by this Resolution and those for which no data are available from the period immediately prior shall be subject to the provisions of this paragraph.
8. At the SAC meeting in the year ²⁰²⁵~~2023~~ and at the subsequent meeting of the IATTC in ²⁰²⁵~~2023~~, the IATTC scientific staff shall present to the SAC an analysis of the unloading, observer, and long-term sampling program data on the catches of sharks in the fisheries in central America with which they shall also recommend any improvement of the resolution including an adjustment on the period of prohibition (paragraph 7).

Q5 COL/US/CHI: Update on items 5 on C-21-06

Information regarding paragraphs 2-13 on resolution C-21-o6, silky sharks

Par.	Provision	Status	
2	Prohibit retaining on board, transshipping, landing, or storing, in part or whole, carcasses of silky sharks (<i>Carcharhinus falciformis</i>) caught by purse-seine vessels in the EPO.	Information is collected from observers on board Class-6 purse-seine vessels. Non-compliance cases are reported to the Compliance Committee.	
3	Require all longline vessels whose fishing licenses do not include sharks as a fishing target but catch sharks incidentally, to limit bycatch of silky sharks to a maximum of 20% of the total catch by fishing trip in weight.	CHN and ECU reported that they regulate the maximum bycatch limit for silky sharks. PAN and TWN reported no interactions with silky sharks in 2021. USA reported low bycatch from 2018 to 2021 (less than 2%) and no interactions in 2022.	
4	Require that multi-species fisheries using surface longlines to limit the catch of silky sharks of less than 100 cm total length to 20% of the total number of silky sharks caught during the trip.	BLZ reported 5% of bycatch of silky sharks less than 100 cm in 2017. CHN reported 7.62% in 2020. ECU has regulated this as a prohibition.	
5	In the case of retention of silky sharks by longline vessels, ensure compliance with the measures established in paragraphs 3 and 4 by means of control and inspection mechanisms, for port CPCs and flag CPCs.	There is no information available on the implementation of this measure.	

Q5 COL/US/CHI: Update on items 6-7 on C-21-06

6	Require vessels to not fish in silky shark pupping areas , as may be adopted by the Commission, in accordance with the recommendation of the IATTC scientific staff, in coordination with the SAC.	Pupping areas have not been defined yet.
7	For those multi-species fisheries using surface longlines that have captured more than 20% of silky sharks in weight on average in a year, the use of steel leaders shall be prohibited during a period of three consecutive months each year.	CRI has sent the notification of the prohibition period for the use of steel leaders for a couple of years. ECU and CHN regulate the prohibition of the use of steel leaders.
11	Notify the Director, before 1 October of each year, the period of restricted use of steel leaders which will be observed for the calendar year.	
12	CPCs shall keep a record of the vessels and the period to which each vessel operator or owner has committed.	There is no information on whether CPCs keep this type of record.
13	CPCs shall require the collection and submission of catch data for silky sharks. CPCs shall also record, through observer programs and other means, for purse-seine vessels of all capacity classes, the number and status (dead/alive) of silky sharks caught and released and report it to the IATTC.	Information is available for Class-6 purse-seine vessels, but not for smaller capacity classes, except for those that voluntarily carry an observer on board.

Q5 COL/US/CHI: Update on item 6 on C-21-06

6 Require vessels to **not fish in silky shark pupping areas**, as may be adopted by the Commission, in accordance with the recommendation of the IATTC scientific staff, in coordination with the SAC.

Pupping areas have not been defined yet.

distribuida de acuerdo a su talla en el OPO. Los tiburones sedosos pequeños (< 90cm LT) y medianos (90 – 150 cm LT), todos ellos juveniles, son predominantemente capturados al norte del ecuador, mientras que tiburones de tallas grandes (> 150 cm LT), talla que incluye una parte de los juveniles y a todos los adultos, son capturados mayormente al sur del ecuador (Román-Verdesoto y Orozco-Zöller, 2005) (Figura 4). Así, una veda pesquera en el norte del OPO, y la

Román-Verdesoto MH (2014) Potential effects of spatial closures on the demography of silky shark *Carcharhinus falciformis* in the eastern Pacific Ocean. MSc thesis, Centro de Investigación Científica y de Educación Superior de Ensenada (CICESE), Baja California

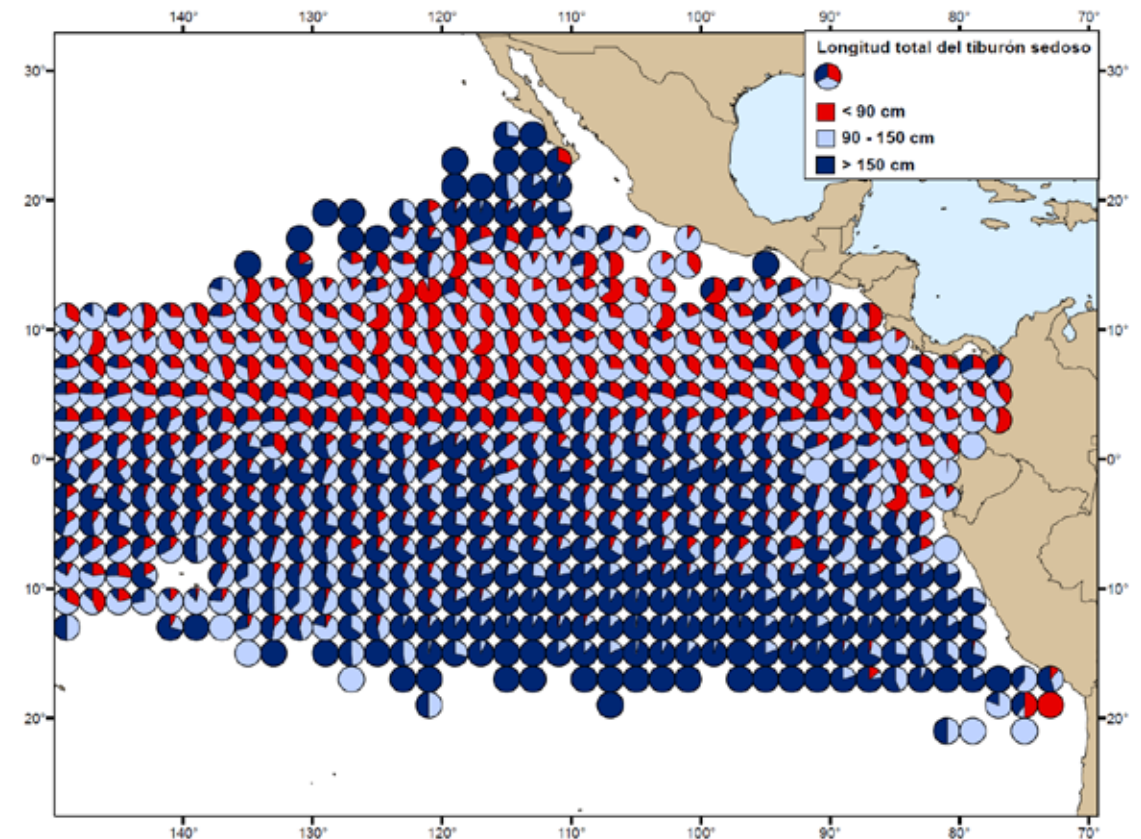
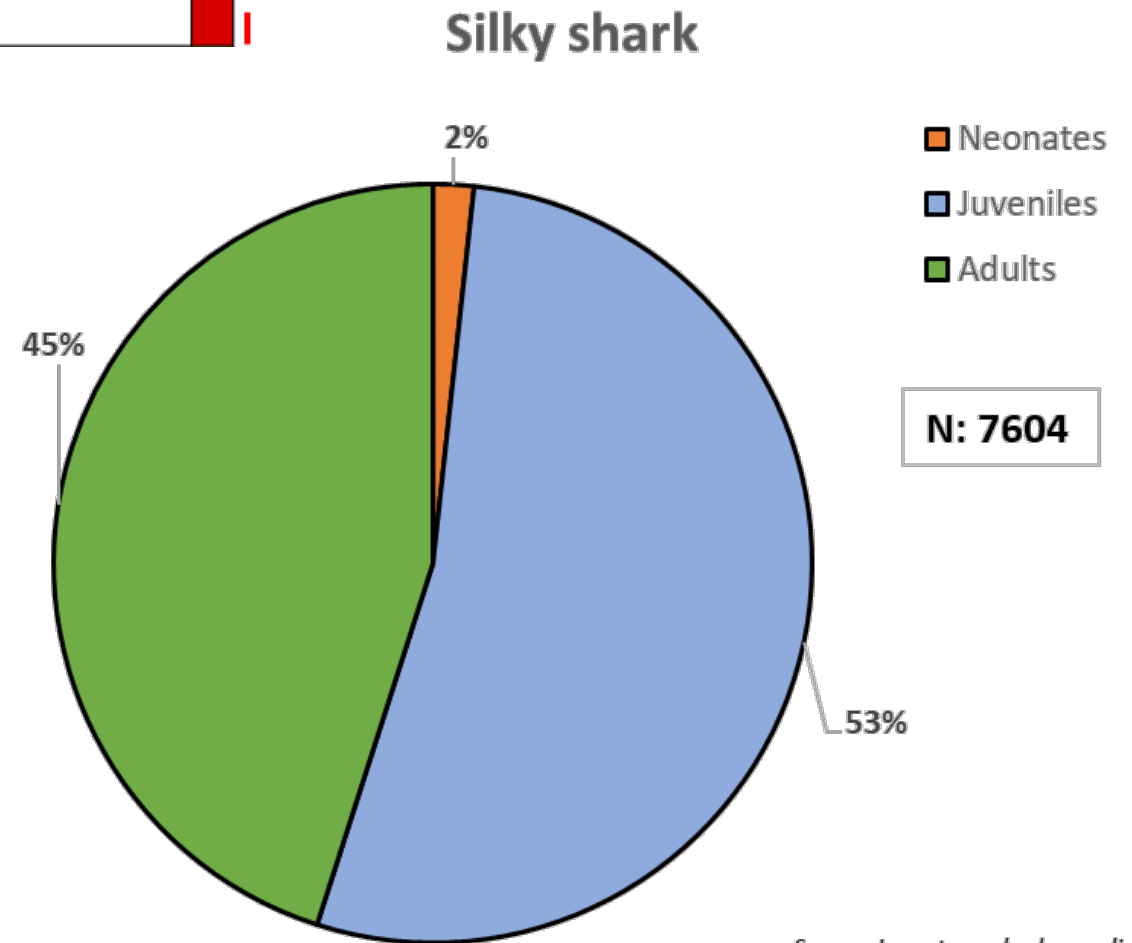


Figura 4. Distribución espacial del tiburón sedoso por categoría de tallas en lances sobre objetos flotantes durante 1994 a 2012. Modificado de Román-Verdesoto y Orozco-Zöller, 2005; p. 30.

Q5 COL/US/CHI: Update on item 6 on C-21-06

6	Require vessels to not fish in silky shark pupping areas , as may be adopted by the Commission, in accordance with the recommendation of the IATTC scientific staff, in coordination with the SAC.	Pupping areas have not been defined yet.
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- The pupping areas have not been defined yet. The ABNJ1-IATTC-EU funded sampling work in Central America reported that some data collected could provide information on possible pupping areas for silky sharks, but it is still too early to make a determination.
- Maintaining the shark sampling program in Central America and completing the studies for this species is necessary. Despite this, the program has been extended to the countries of Mexico, Ecuador, and Peru (ABNJ2), which will provide complementary information to clarify this point.



Source: Long-term shark sampling program in Central America

Q6 GTM: staff's plans on Climate Change

- Ongoing projects:

5. INTERACTIONS AMONG THE ENVIRONMENT, THE ECOSYSTEM, AND FISHERIES

- N.1.b:** Investigate the effects of wind-induced microturbulence on yellowfin larval survival
- N.1.c:** Developing dynamic species distributions models to inform conservation and management of non-target species and communities in the eastern Pacific Ocean
- N.2.a:** Develop models of the effects of **climate change** on pre-recruit life stages of tropical tunas
- N.2.b:** Supporting climate-ready and sustainable fisheries: using satellite data to conserve and manage life in the ocean and support sustainable fisheries under **climate change**
- O.2.a:** Develop and implement analytical tools for understanding the trophic ecology of apex predators
- O.2.b:** An updated ecosystem model of the tropical EPO for providing standardized ecological

PROJECT N.2.b: Supporting climate-ready and sustainable fisheries: using satellite data to conserve and manage life in the ocean and support sustainable fisheries under climate change

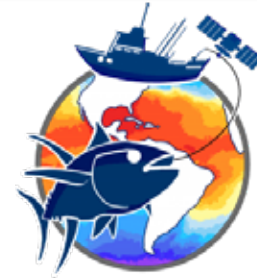
THEME: Interactions among the environment, the ecosystem and fisheries

GOAL: N. Improving our understanding of the EPO ecosystem

TARGET: N.2. Understanding the effects of long-term climate drivers

EXECUTION: Ecosystem and Bycatch Program

FACET, a fisheries-climate project funded by NASA with SDSU and IATTC as partners



- Dan Crear, PhD: the **new senior vulnerable species ecologist** will join the scientific staff on **September 1**. Among Dan's **skills and expertise**:
 - Species Distribution Models.
 - Processing large environmental databases.
 - Relationship between environmental variables and species at different spatio-temporal scales, including large-scale processes like ENSO and Climate Change.
 - Participatory approaches with stakeholders on designing Climate Change adaptation plans.

Q6 GTM: staff's plans on Climate Change

Future plans:

- Develop a library of SDMs for species and sizes of interest (target species are ready).
- Investigate the effects of environment at different spatio-temporal scales on species and the ecosystem, including ENSO effect and marine heatwaves, among others.
- Project species and fleets distributions under different climate change scenarios.
- Assess the accuracy, and better understand uncertainty, of climate change projections.
- Engage with CPCs and relevant stakeholders and experts to begin a participatory approach to discuss climate change priorities and adaptation plans.
- Explicitly incorporate climate change research in the new SSP.

Q7 VEN: Figure 8.b (SAC-14-03)

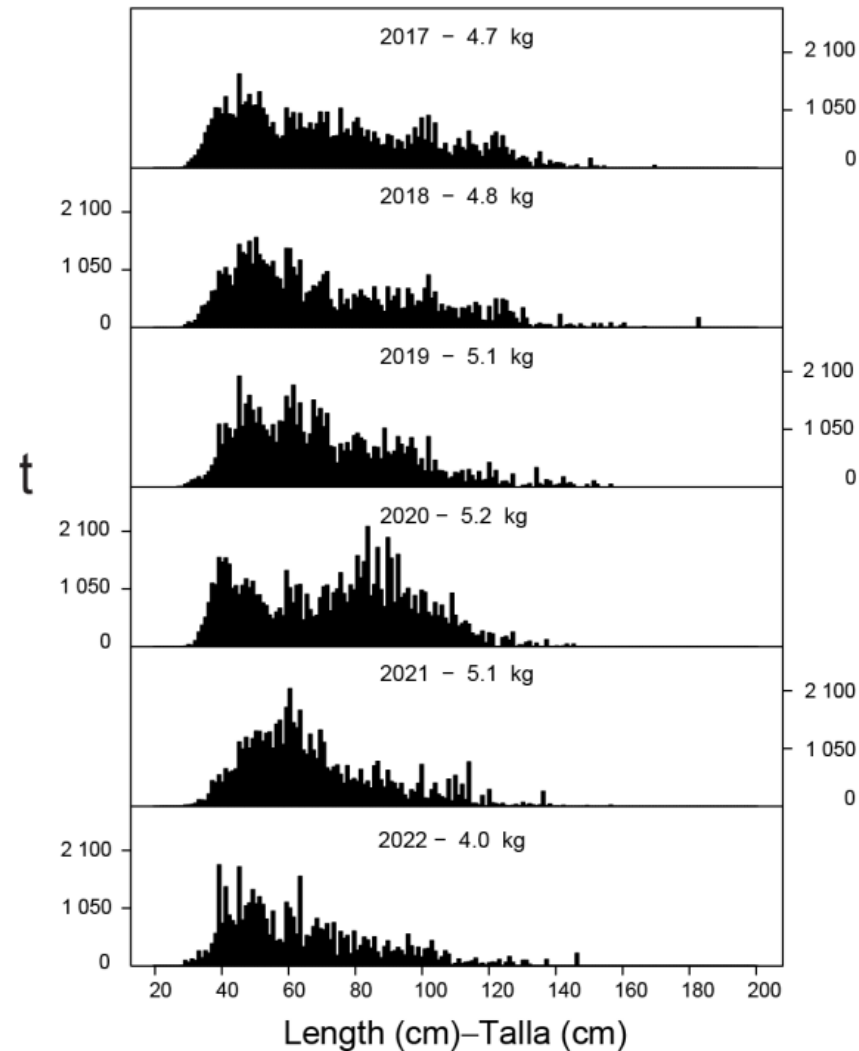


FIGURE A-8b. Estimated size compositions of the bigeye caught by purse-seine vessels in the EPO during 2017-2022. The value at the top of each panel is the average weight.

FIGURA A-8b. Composición por tallas estimada del patudo capturado por buques cerqueros en el OPO durante 2017-2022. El valor en cada recuadro representa el peso promedio del pescado en las muestras.

Q8 NIC: Variability of observed data vs EMP

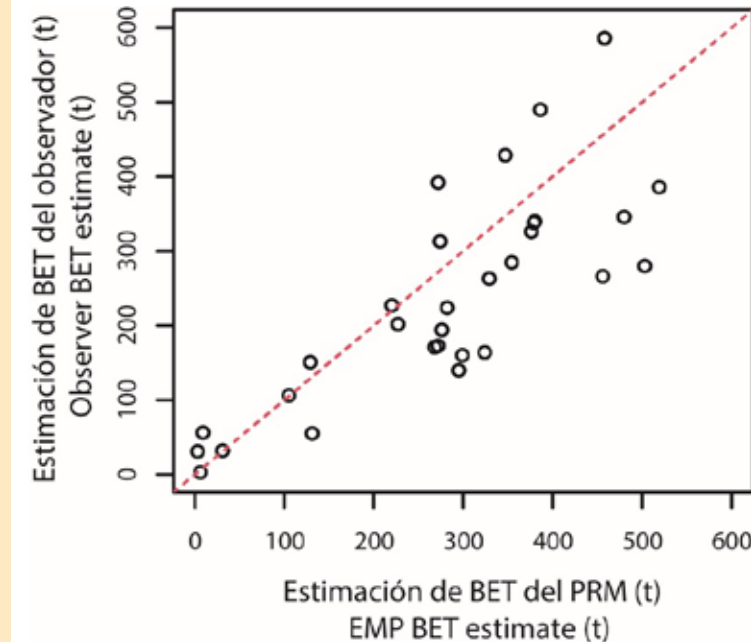
1) What is the variability of the observer estimates compared to the EMP estimates?

a) Preliminary comparison of observer and EMP estimates:

- Observer estimates can be quite similar to EMP estimates.
- However, this is not the dominant outcome seen so far, especially at larger catch amounts (e.g., more than about 250t BET in the figure), where EMP estimates were often larger.
- As more EMP data are collected, further comparisons will be made.

b) Comparisons using the pilot study intensive sampling data (presented at SAC):

- Error on the observer estimates was often larger than the error on the simulated EMP estimates.
- The estimates of some observers were negatively biased.



2) What larger amounts of BET catch are related to more differences between observer and EMP estimates?

- Please see response to (1).
- Once more EMP data have been collected, more detailed analyses will be conducted.

Q8 NIC: Variability of observed data vs EMP

3) What percentage of the fleet with big BET catch are you targeting, or have you sampled so far?

- We continue to follow the approach outlined at SAC: trips that are a priority for sampling are those currently catching larger amounts of BET and those of vessels with historically high BET catches.
- Vessels with historically high BET catches were defined as those vessels that were among the top 30 vessels (in total annual BET catch) at least once in 2016 – 2020.
- Since March, 25 vessels (40 trips) have been sampled. Of these vessels, 22 had historically high catch of BET.
- A more comprehensive summary of sampling coverage for 2023 will be provided at SAC 2024.



Preguntas - Questions