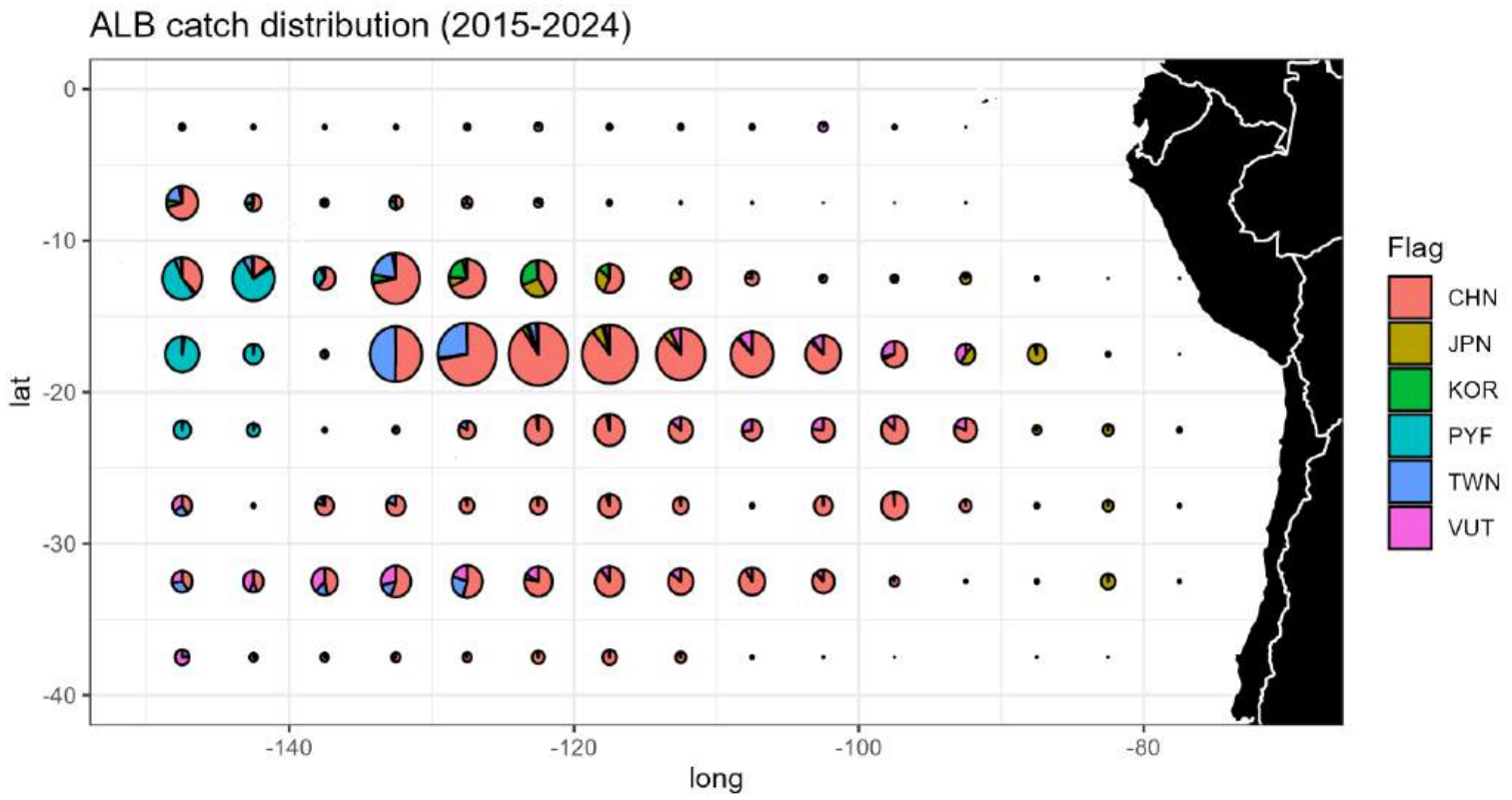
Respuestas del personal a las solicitudes del CCA

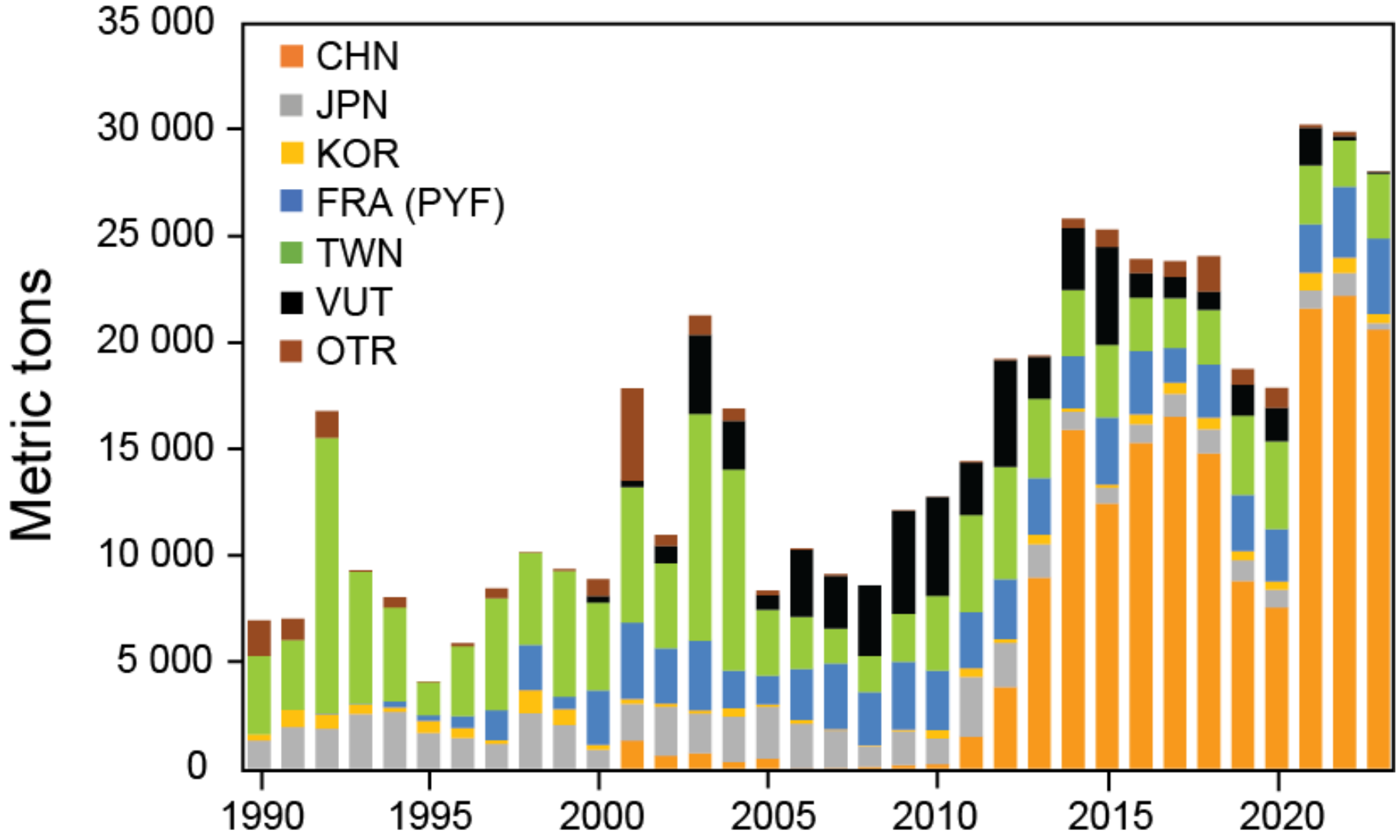
Staff's responses to requests by the SAC

16ª Reunión del Comité Científico Asesor - 2-6 de junio de 2025
16th Meeting of the Scientific Advisory Committee – 2-6 June 2025
La Jolla, California, USA-EE.UU.

Q3 JPN: S-ALB LL catch distribution by CPC

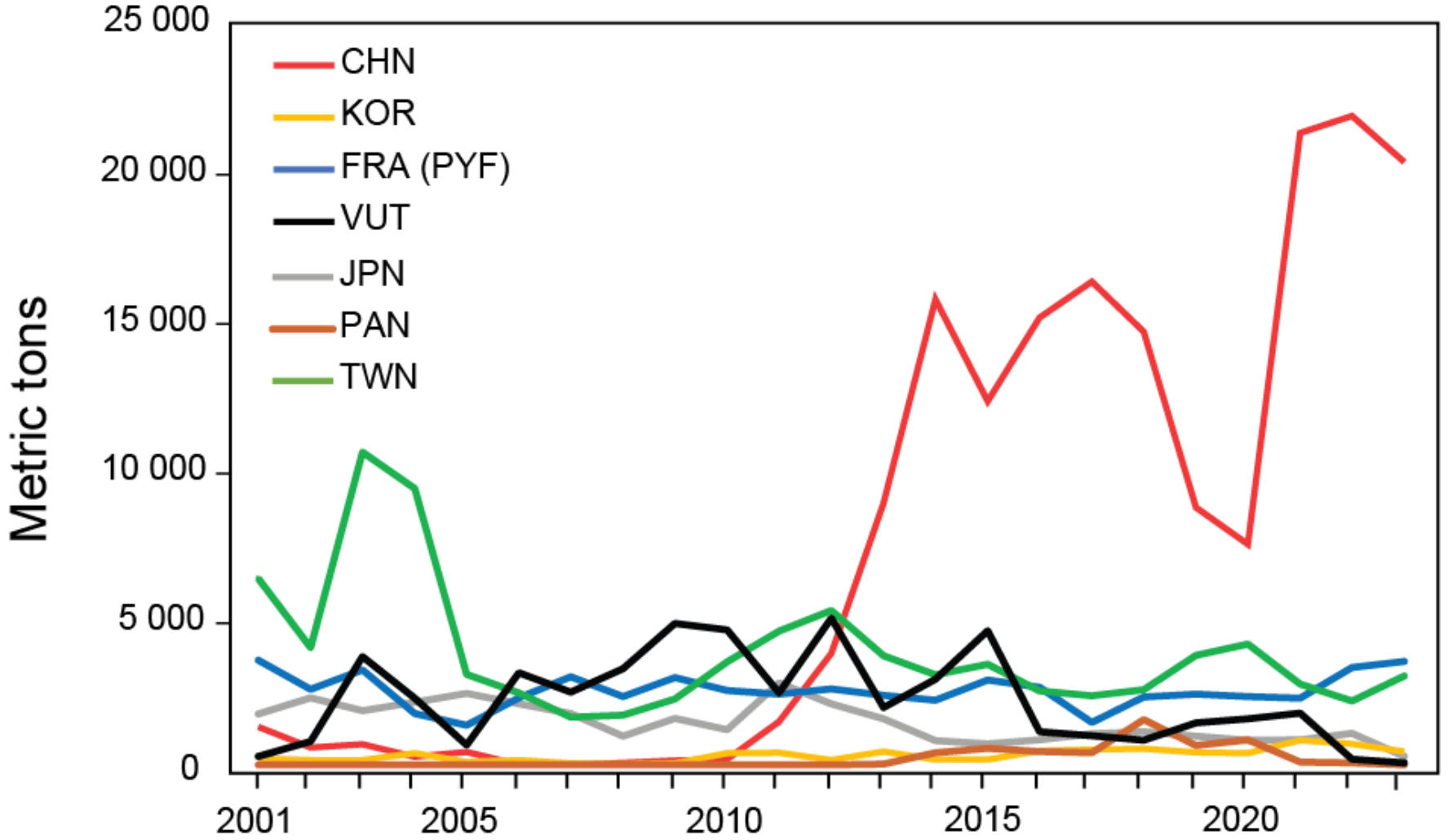


Q3 JPN: S-ALB catches by CPC for All Gears (South of 10S)

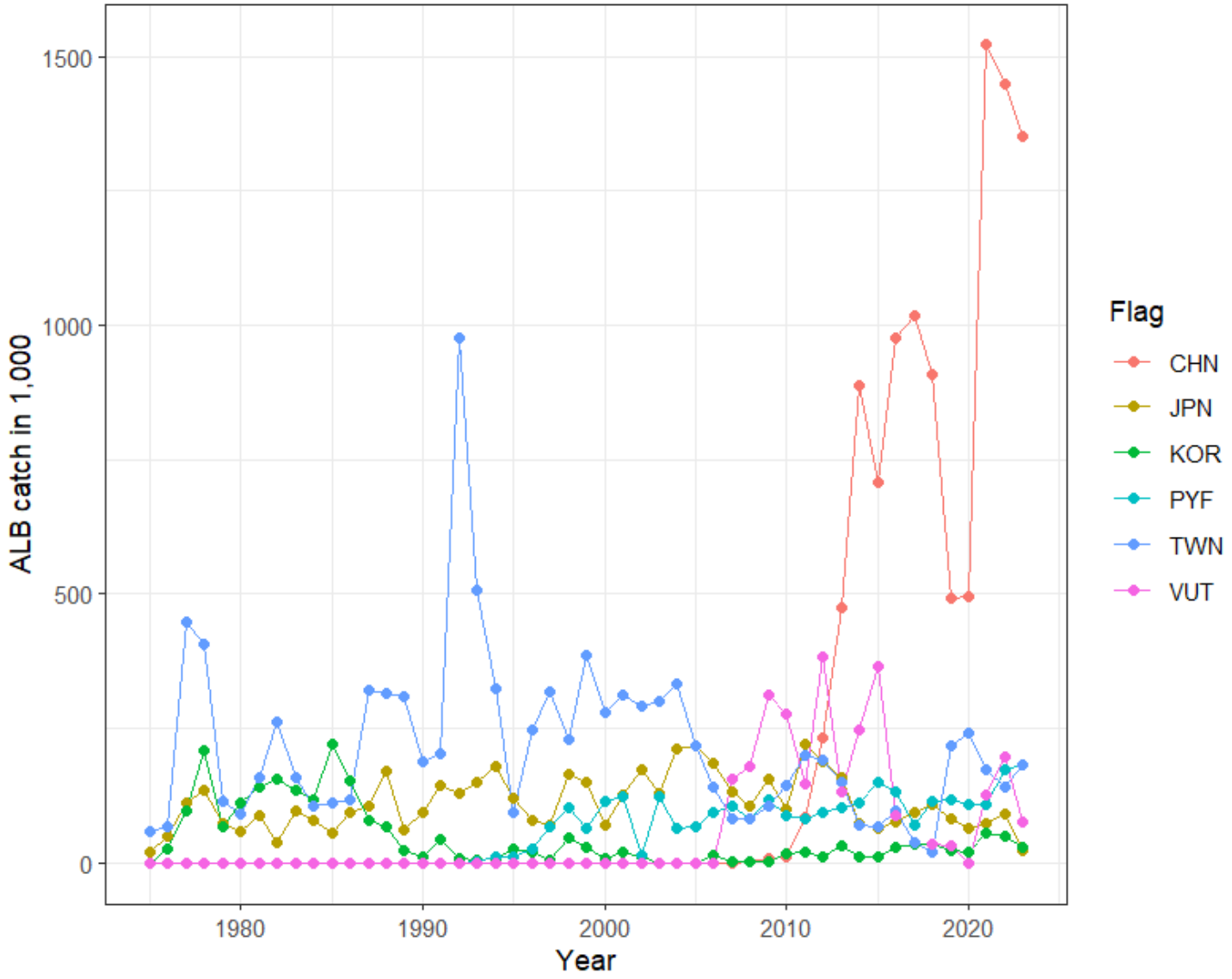


Q3 JPNv: S-ALB LL catches by CPC (South of 10S)

In metric tons

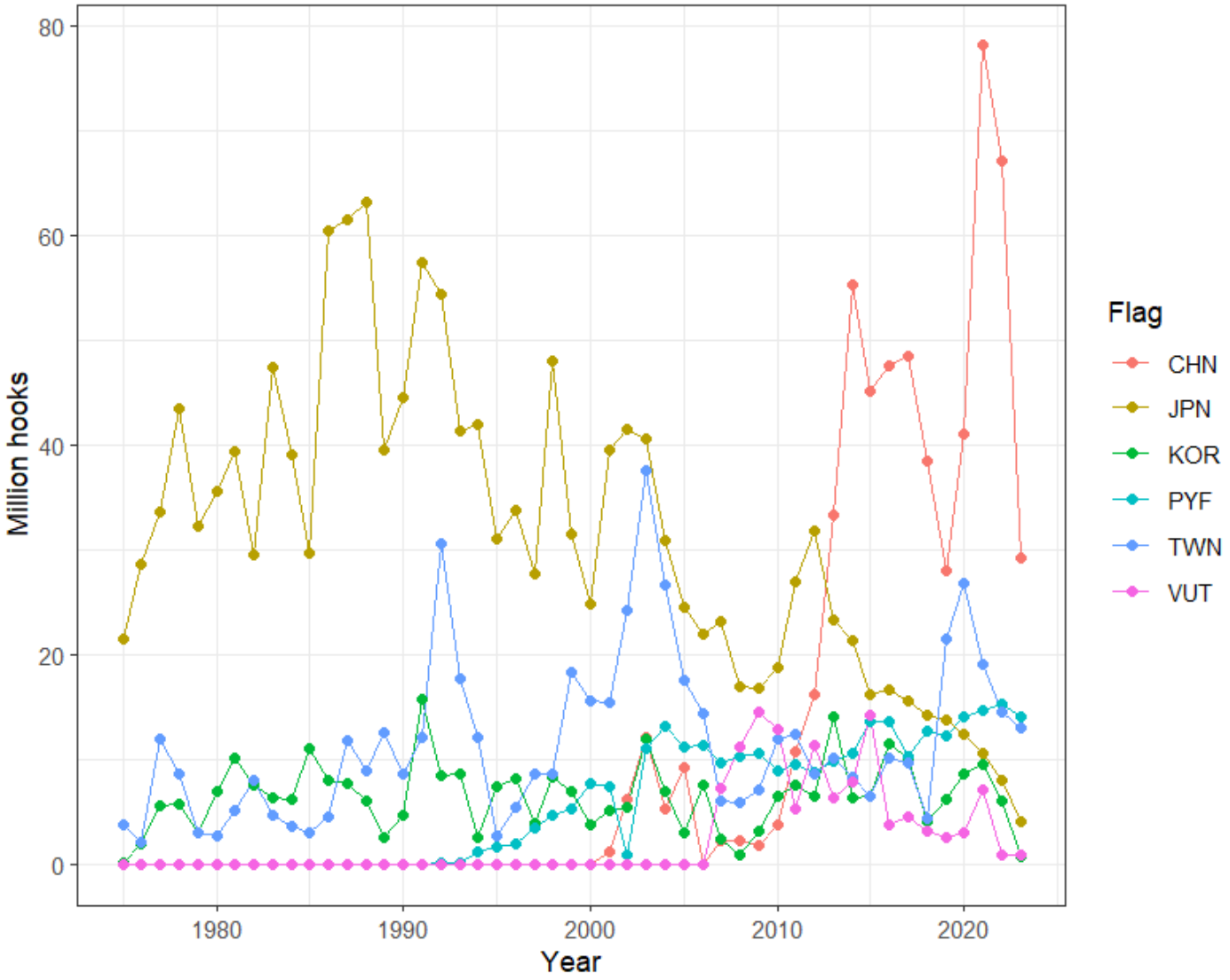


Q3 JPN: S-ALB LL catch (thousands of fish) by CPC (South of 10°S)



Year	CHN	JPN	KOR	PYF	TWN	VUT
2002	0	174.997	10.74	15.431	291.63	0
2003	0	128.022	0	124.393	301.817	0
2004	0	212.751	0	65.136	332.155	0
2005	0	218.161	0	66.032	219.127	0
2006	0	184.051	13.277	92.795	142.209	0
2007	0	132.143	2.986	105.668	83.463	156.736
2008	3.669	105.088	1.079	80.81	82.962	178.516
2009	8.952	155.283	2.648	117.199	104.422	313.296
2010	10.976	99.782	15.89	88.3	143.906	276.152
2011	84.571	220.528	20.13	82.668	200.968	148.28
2012	233.837	187.757	9.823	93.584	190.06	382.924
2013	473.473	158.041	30.911	103.824	149.775	132.663
2014	889.411	72.943	12.426	112.197	70.134	246.517
2015	707.147	65.5	12.334	151.414	67.308	365.221
2016	977.503	75.915	29.889	133.539	95.677	89.06
2017	1017.037	93.747	34.248	71.446	37.968	63.588
2018	907.531	108.017	34.853	115.547	19.809	33.952
2019	493.312	80.768	22.486	117.641	217.538	31.771
2020	496.863	64.991	21.191	110.009	241.87	0
2021	1521.66	73.876	55.322	108.048	173.306	127.509
2022	1449.93	91.843	49.477	174.291	140.882	195.792
2023	1352.383	24.351	29.704	183.327	183.72	75.846

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



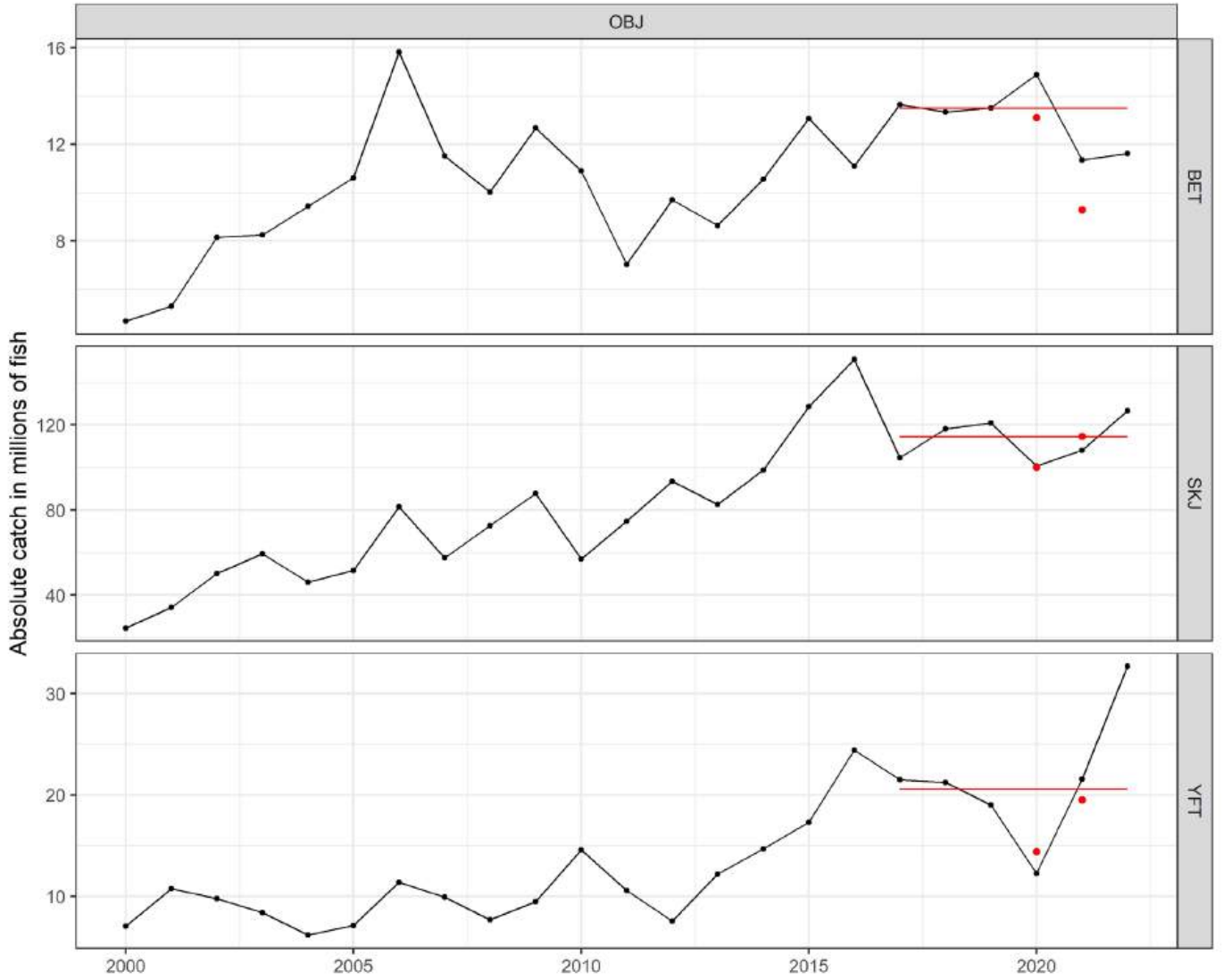
Year	CHN	JPN	KOR	PYF	TWN	VUT
2002	6.2572	41.56962	5.475942	0.943124	24.15805	0
2003	12.11645	40.59478	11.88022	10.99687	37.51344	0
2004	5.204068	30.95415	6.888575	13.23853	26.64535	0
2005	9.175778	24.52044	3.072992	11.16442	17.59749	0
2006	0	21.99709	7.600376	11.38529	14.40409	0
2007	2.26129	23.20349	2.371113	9.669341	6.103756	7.273947
2008	2.242535	16.95597	0.92982	10.2485	5.869309	11.18447
2009	1.81905	16.78176	3.131497	10.65514	7.129422	14.54618
2010	3.75684	18.81054	6.513382	8.975896	11.96274	12.8454
2011	10.74402	26.8941	7.552107	9.514119	12.39539	5.314041
2012	16.21078	31.85716	6.444845	8.79485	8.592146	11.29826
2013	33.31219	23.30998	14.01281	9.845162	10.16178	6.367406
2014	55.39305	21.37425	6.390296	10.5366	8.354696	7.872656
2015	45.19318	16.24624	6.466973	13.6595	6.518238	14.24295
2016	47.65182	16.67743	11.42911	13.57265	10.14168	3.791058
2017	48.49008	15.64241	10.20158	10.34043	9.723107	4.493063
2018	38.56018	14.16052	4.029812	12.74939	4.388198	3.204866
2019	27.95631	13.77159	6.169463	12.26032	21.47257	2.572728
2020	41.01928	12.33906	8.652531	14.11102	26.8854	3.016835
2021	78.15317	10.5566	9.4885	14.63984	19.01431	7.165572
2022	67.13243	7.979542	6.016844	15.31133	14.47427	0.887048
2023	29.20357	4.126467	0.791524	14.14642	12.97812	0.93119

CIAT

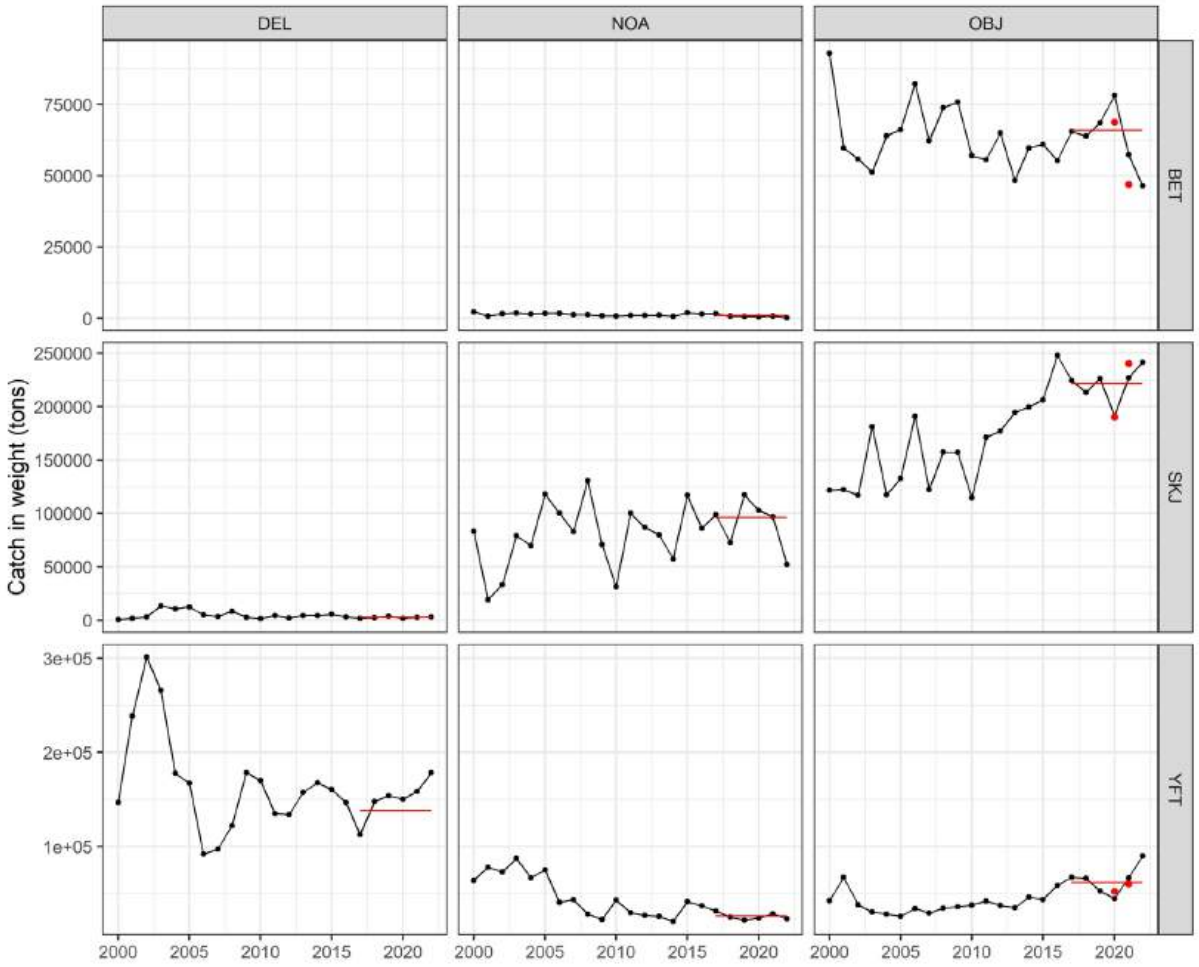
IATTC

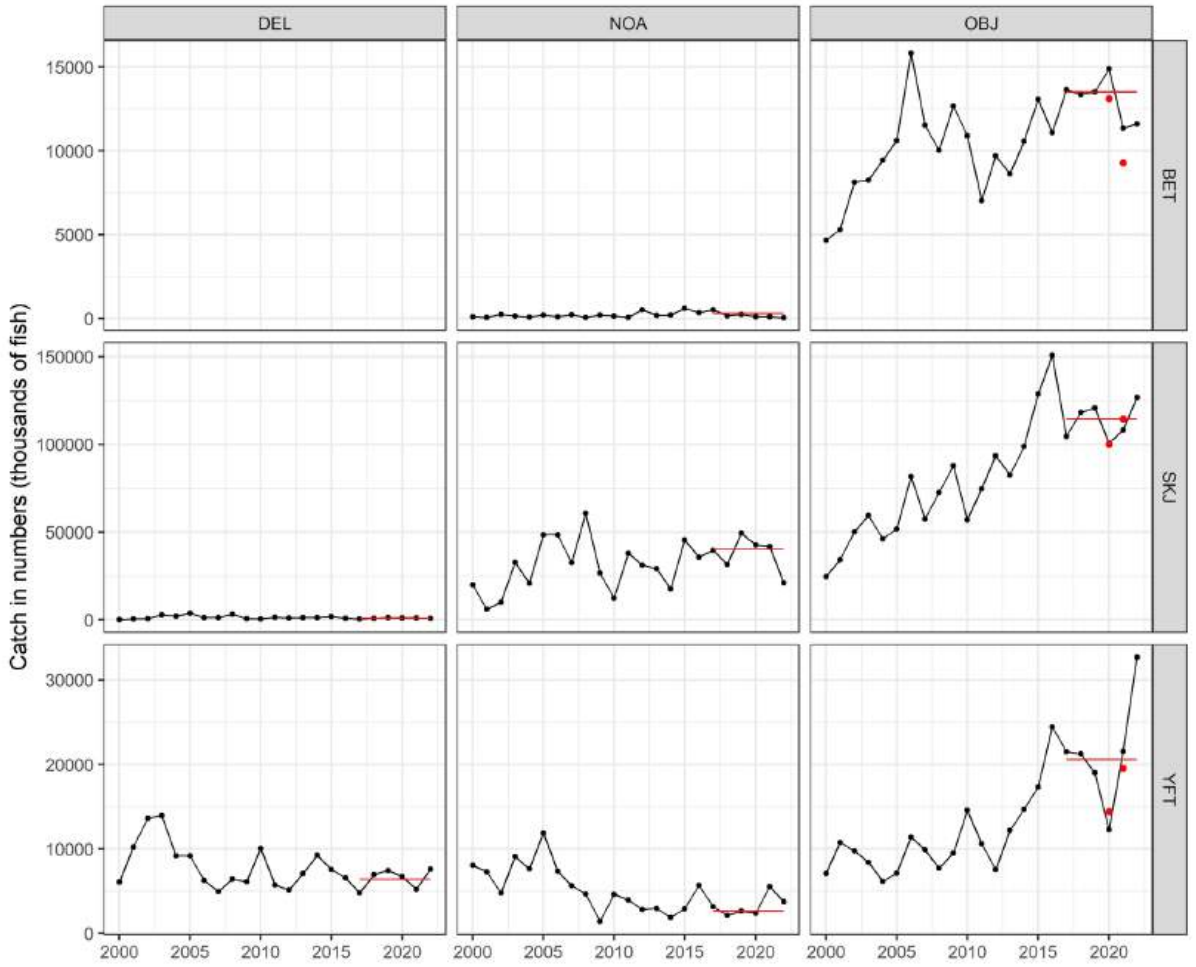
Preguntas - Questions

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

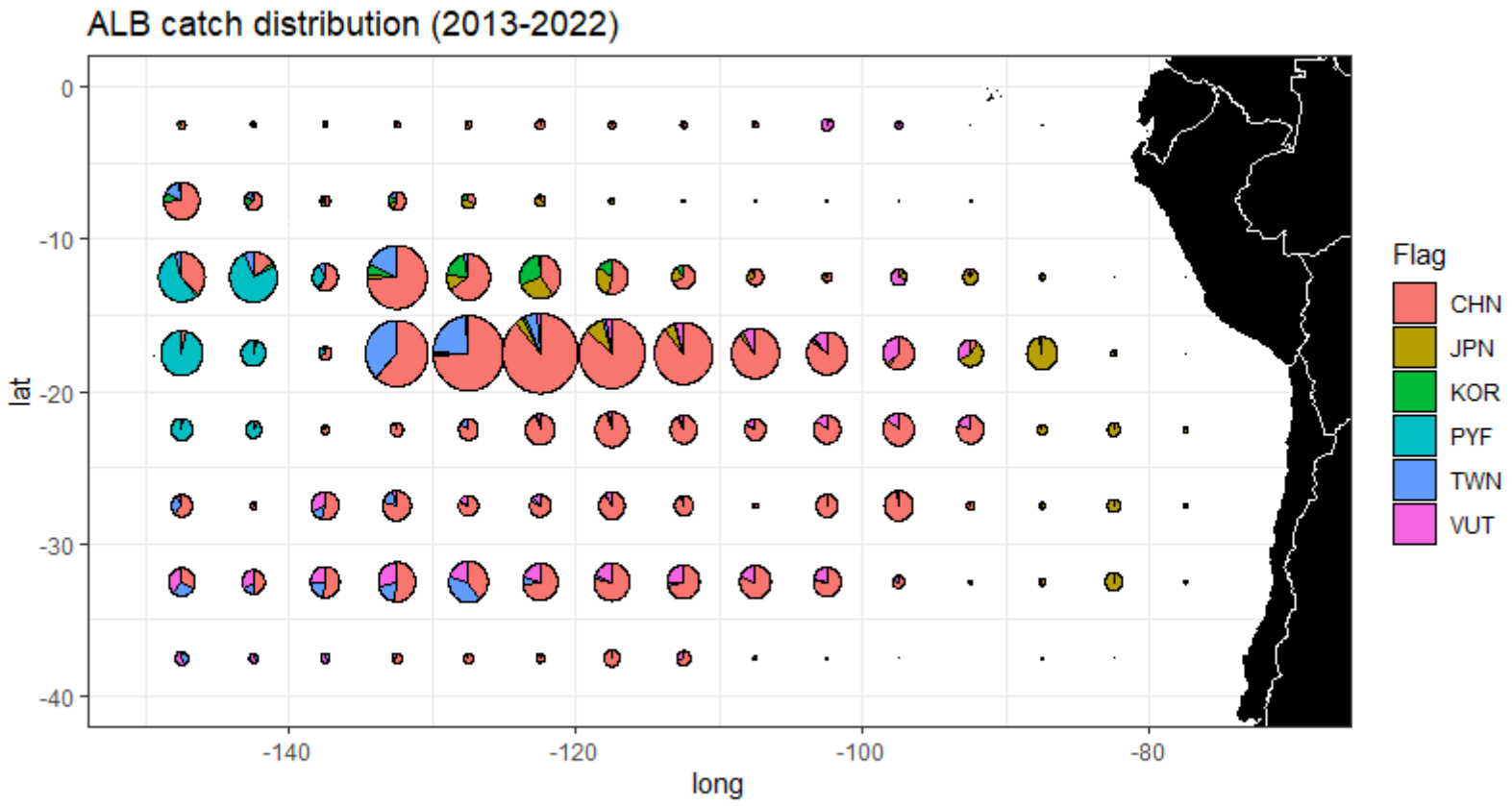
- Review on contents of the proposal
  - Proposal introduces interim proxy reference points (RP) for species where C-16-02 reference points cannot be reliably estimated.
  - Proxy target RP related to 0.3 SBR (more conservative than those in C-16-02).

Btarget = 0.3 SAC-14-09

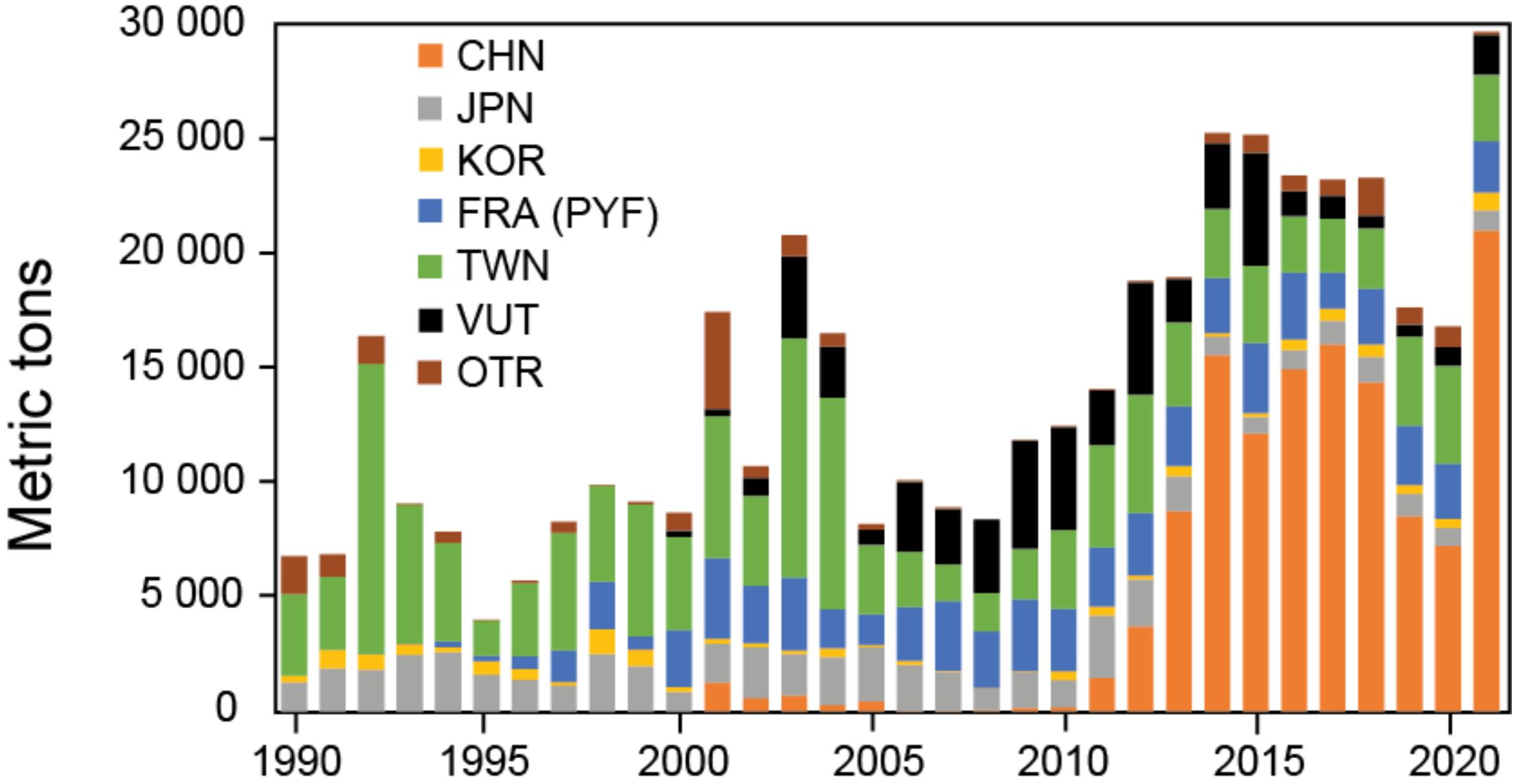
Steepness (*h*)	Bigeye	Yellowfin
1.0	0.20 – 0.24	0.23 – 0.32
0.9	0.25 – 0.27	0.28 – 0.35
0.8	0.28 – 0.30	0.32 – 0.37
0.7	0.31 – 0.32	0.35 – 0.40

- 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.

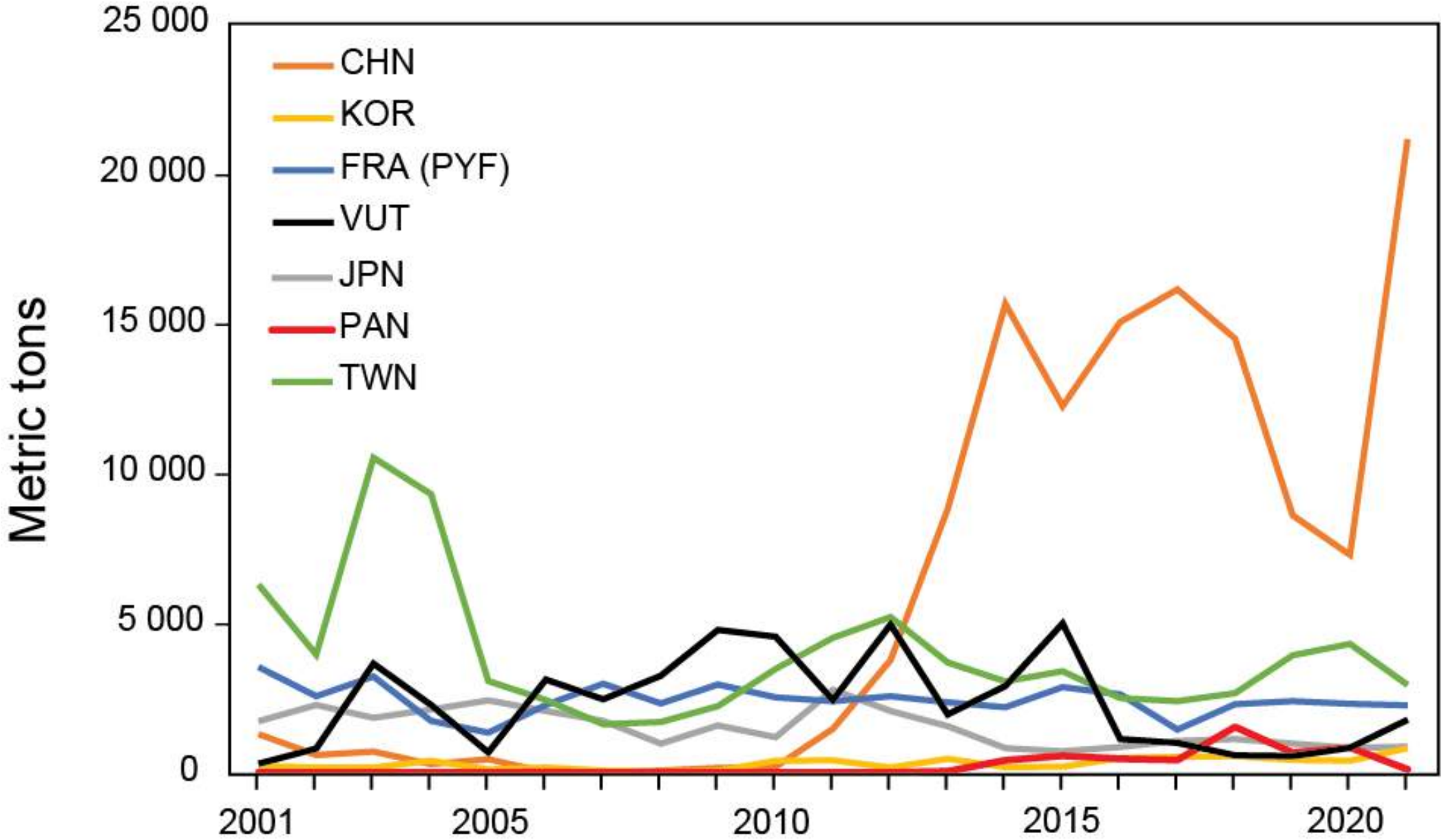
Q3 JPN: S-ALB LL catch distribution by CPC



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



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

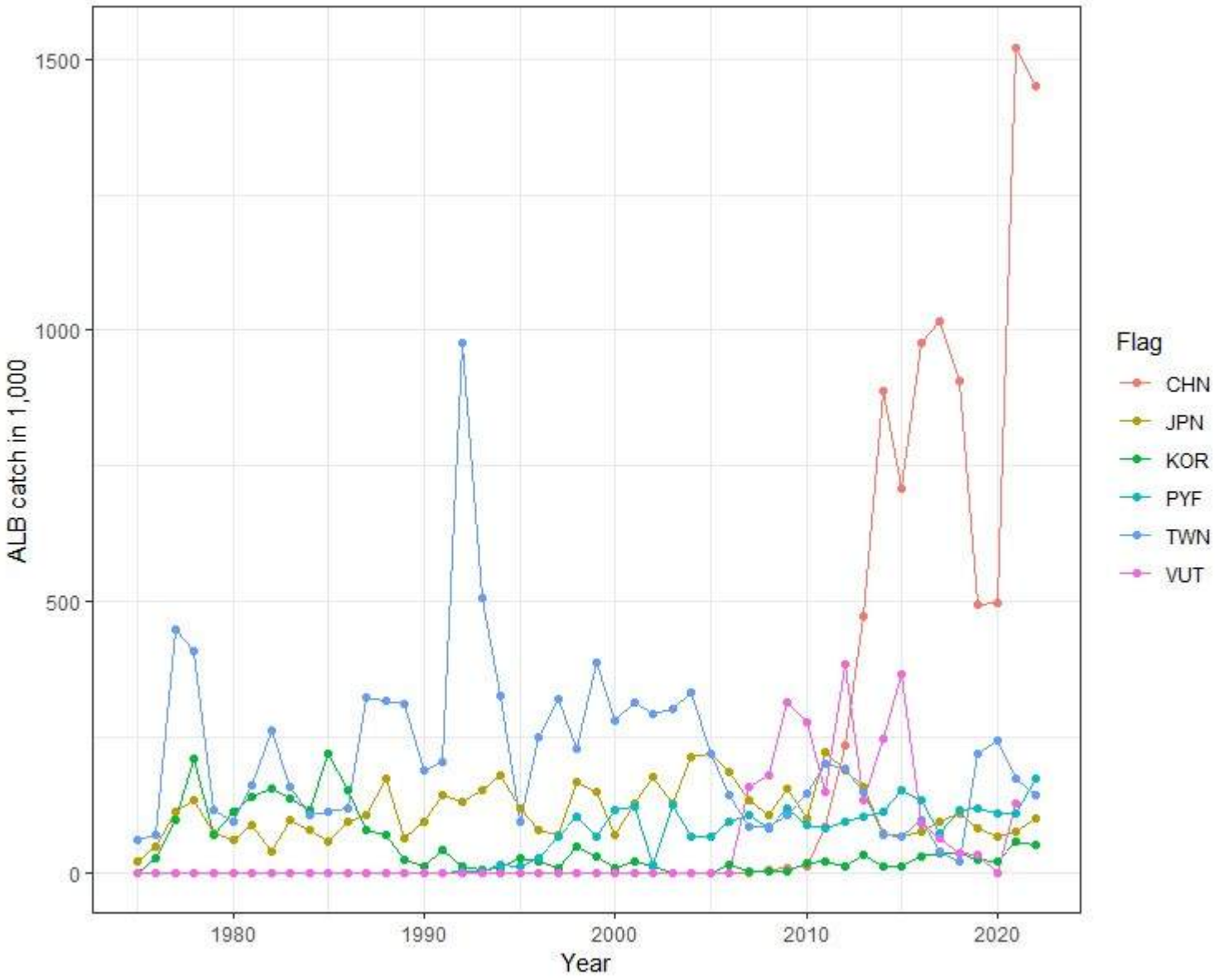


Q3 JPN: S-ALB LL catches by CPC (South of 10S)

In metric tons

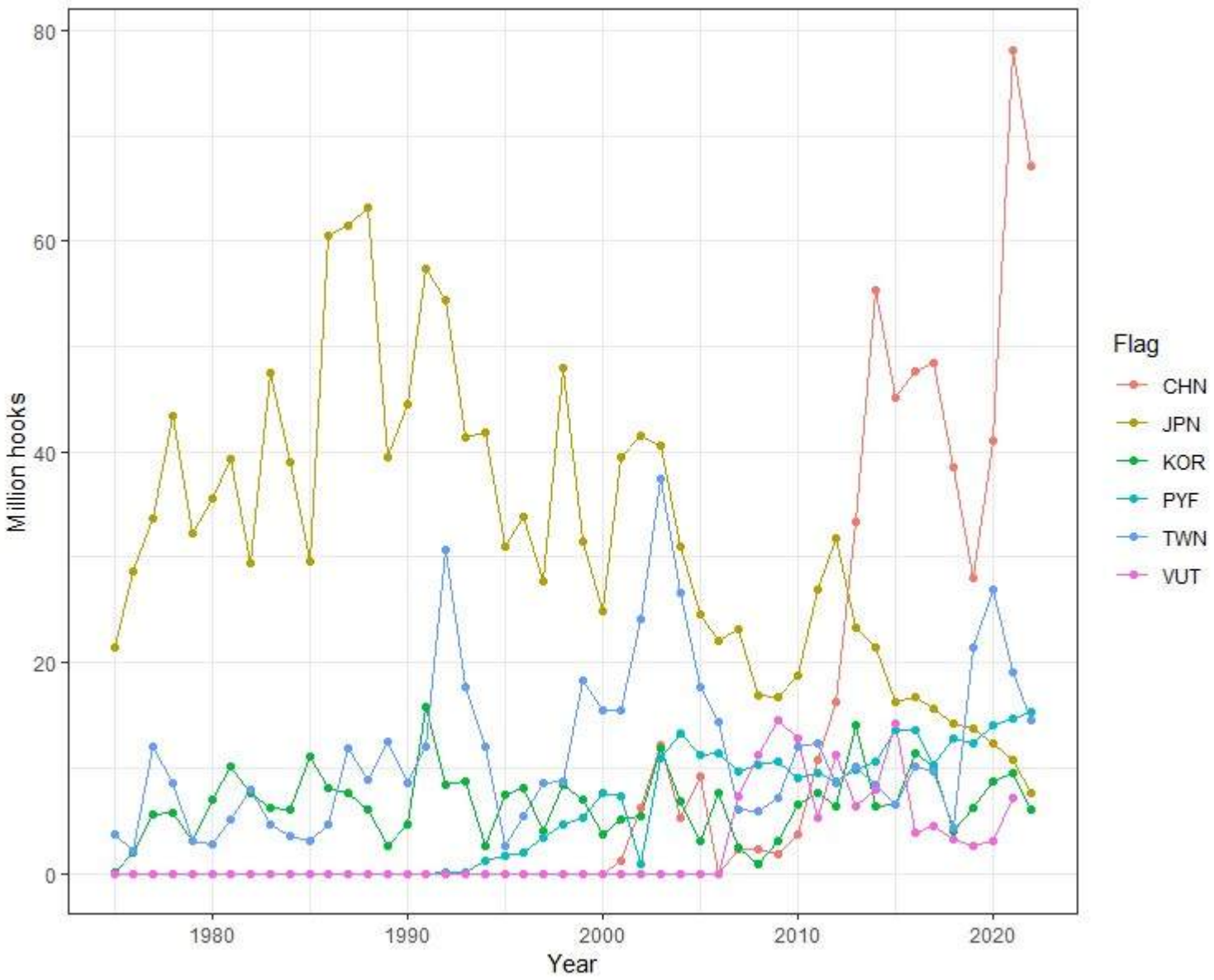
Year	CHN	JPN	KOR	PAN	PYF	TWN	VUT
2,001	1,276	1,713	220	2	3,524	6,273	294
2,002	586	2,252	161	-	2,545	3,937	794
2,003	694	1,827	162	6	3,200	10,519	3,640
2,004	278	2,104	397	2	1,724	9,302	2,249
2,005	440	2,407	101	5	1,329	3,050	666
2,006	10	2,050	165	7	2,254	2,415	3,098
2,007	12	1,729	61	-	2,962	1,604	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)



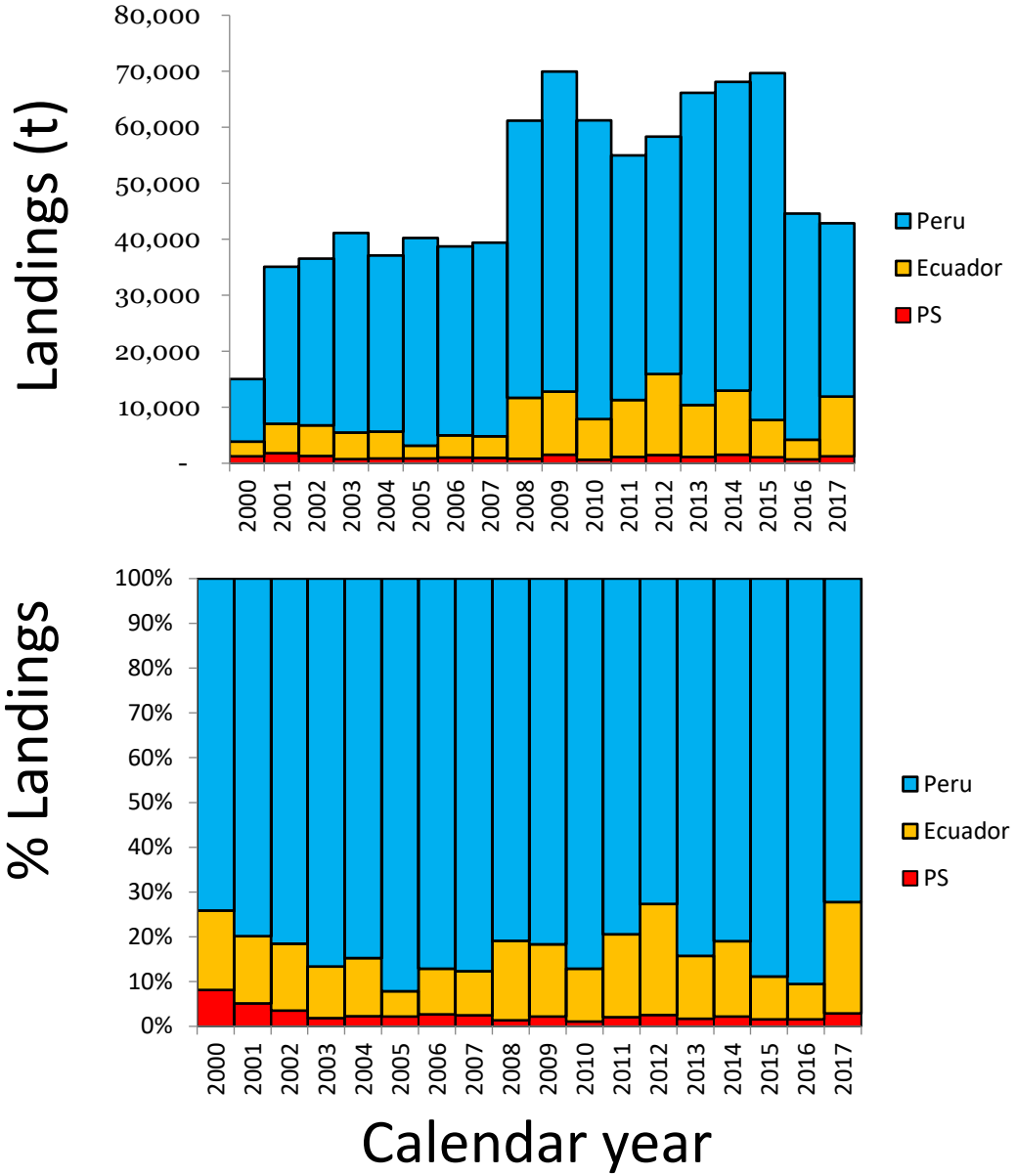
Year	CHN	JPN	KOR	PYF	TWN	VUT
2001	0	126	20	122	313	0
2002	0	175	11	15	292	0
2003	0	128	0	124	302	0
2004	0	213	0	65	332	0
2005	0	218	0	66	219	0
2006	0	184	13	93	142	0
2007	0	132	3	106	83	157
2008	4	105	1	81	83	179
2009	9	155	3	117	104	313
2010	11	100	16	88	144	276
2011	85	221	20	83	201	148
2012	234	188	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 ~~2023~~ 2025 and at the subsequent meeting of the IATTC in ~~2023~~ 2025, 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-21-06, silky sharks

Par.	Provision	Status	
2	**Prohibit retaining** on board, **transshipping, landing, or storing**, in part or whole, carcasses of **silky sharks** (*Carcharhinus falciformis*) **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

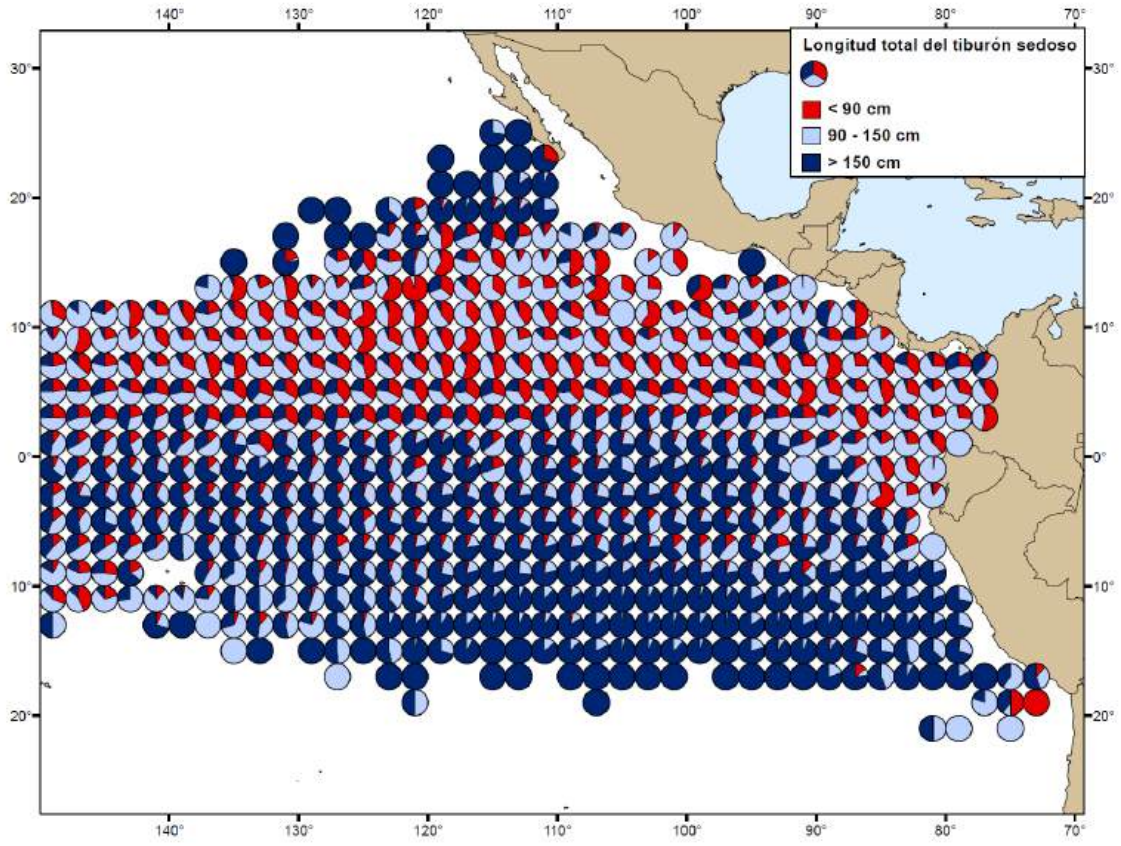


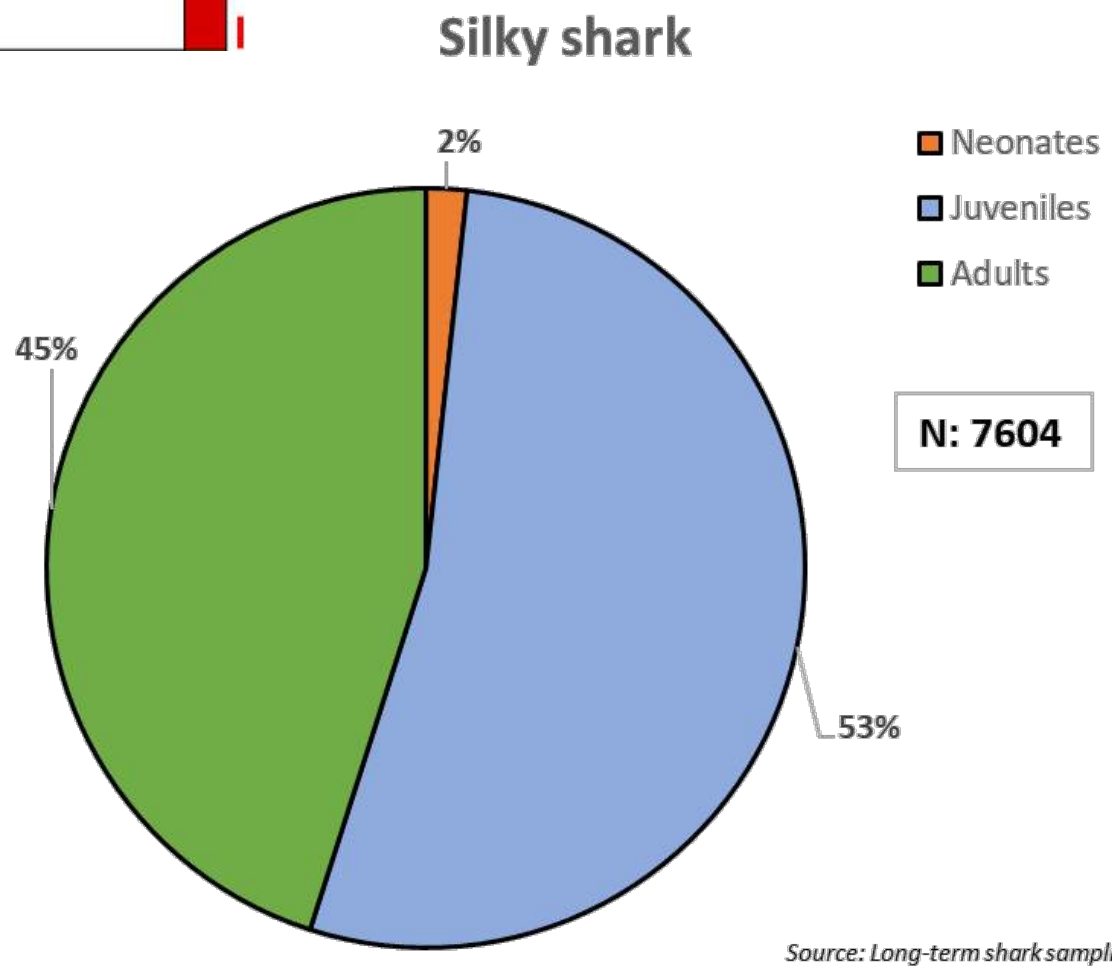
Figura 4. Distribución espacial del tiburón sedoso por categoría de tallas en lances sobre objetos flotantes durante 1994 a 2012. Modificado de Román-Verdesoto y Orozco-Zöller, 2005; p. 30.

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.

- 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

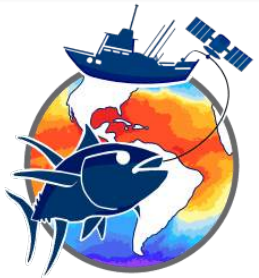
Q6 GTM: staff's plans on Climate Change

- **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)

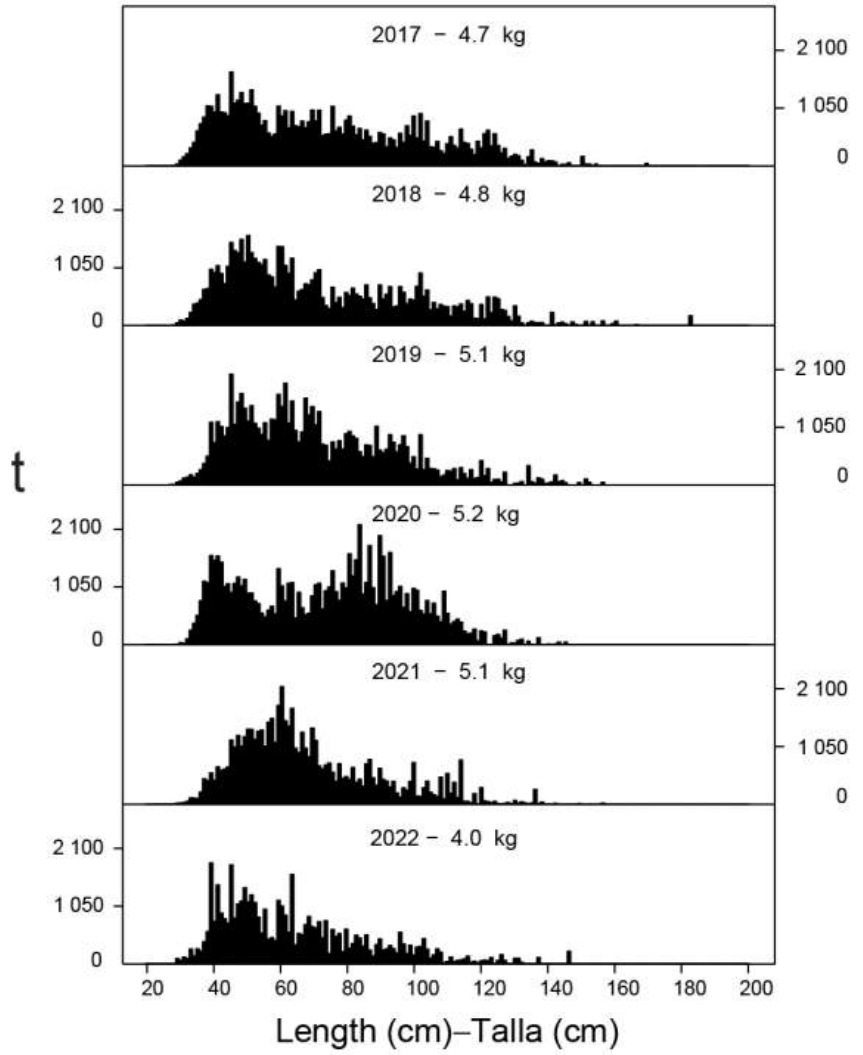
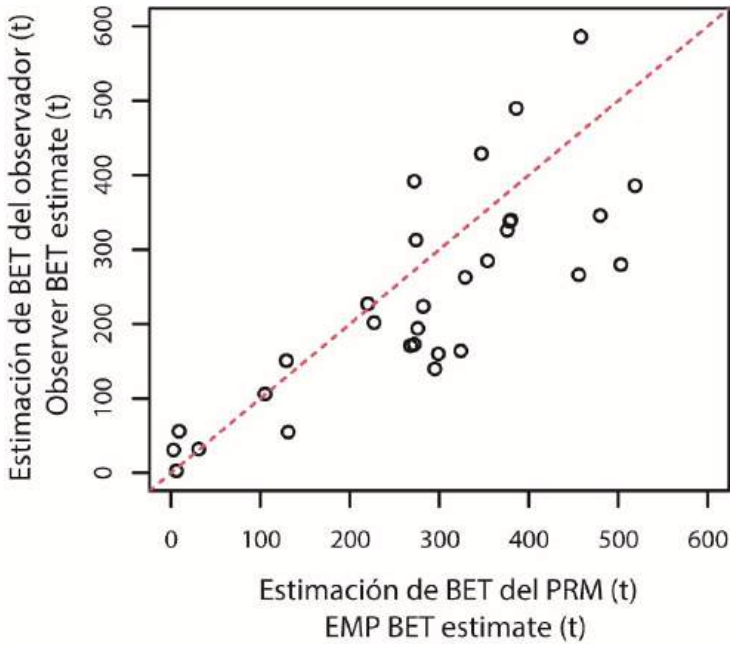


FIGURE A-8b. Estimated size compositions of the bigeye caught by purse-seine vessels in the EPO during 2017-2022. The value at the top of each panel is the average weight.
FIGURA A-8b. Composición por tallas estimada del patudo capturado por buques cerqueros en el OPO durante 2017-2022. El valor en cada 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.

CIAT

IATTC

Preguntas - Questions

Extra slides below

Comentarios adicionales del personal – Additional comments by staff

- Se expresó la preocupación de que las estimaciones del PRM no puedan utilizarse para cumplimiento porque son simplemente estimaciones con incertidumbre.
- El personal hace notar que las CPC ya están realizando sus deliberaciones para determinar si un buque tiene extensión de veda utilizando estimaciones (observador, bitácora, conservera).
- Actualmente no se dispone de medidas de precisión para dichas estimaciones.
- El PRM proporciona a las CPC una fuente adicional de estimaciones, así como una medida de la precisión para dichas estimaciones.

- Concerns were expressed that the EMP estimates cannot be used for compliance because they are simply estimates with uncertainty.
- The staff notes that CPCs are already making their deliberations to determine if a vessel goes into extending closure using estimates (observer, logbook, cannery).
- Measures of precision are not currently available for those estimates.
- The EMP provides CPCs with an additional source of estimates, as well as a measure of the precision for those estimates.

Comentarios adicionales del personal – Additional comments by staff

Dos posibles usos de las estimaciones del PRM en relación a la Resolución C-21-04:

1) Incluir las estimaciones de BET del PRM al momento de determinar la captura anual del buque.

2) Considerar el intervalo de confianza del 95% de las estimaciones del PRM como una herramienta de evaluación al momento de considerar las estimaciones de otras fuentes.

En conclusión, la Resolución C-21-04 estableció el PRM para proveeer apoyo a los CPC en la determinación de las capturas de BET de sus buques, recalcando que la determinación de la captura de cada buque es responsabilidad del Estado de pabellón.

Two possible uses of EMP estimates in relation to Resolution C-21-04:

1) Include the EMP BET estimate when computing the annual catch for the vessel.

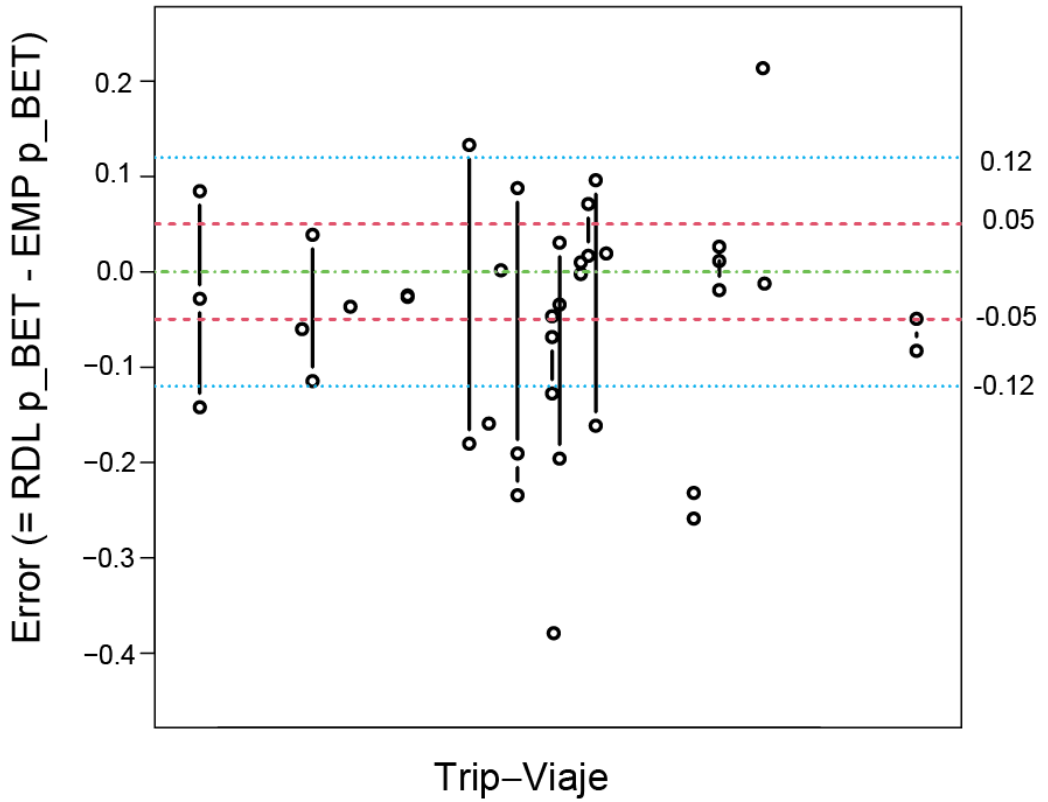
2) Consider the 95% confidence interval on the EMP estimate as an evaluation tool when reviewing estimates from other sources.

In conclusion, Resolution C-21-04 established the EMP to provide support to CPCs in the determination of their vessels catches of BET, noting that the determination of the catch of each vessel is the responsibility of the flag CPC.

Comparación entre estimaciones del PRM y RDL - Comparison of EMP and RDL estimates

- Con enfoque en aquellas bodegas muestreadas durante la Fase 1 con capturas de lances OBJ realizados al oeste de 110°O:
  - Para algunas bodegas, el error (RDL – PRM) fue superior al más alto error del estudio de simulación para el protocolo de 3.33% (1 de cada 30).
  - Los mayores errores tienden a ser negativos.
  - Cuando agrupados por viaje, hay múltiples viajes con altos errores negativos.

- Focusing on those wells sampled in Phase 1 with catch from OBJ sets made west of 110°W:
  - For some wells, the error (= RDL – EMP) was larger than the largest error from the simulation study for the 3.33% (1-of-3) protocol.
  - The largest errors tended to be negative.
  - When grouped by trip, there are multiple trips with large negative errors.



Number of OBJ-set wells sampled per trip by the IATTC regular port-sampling program

						Total trips sampled	% Trips with 1-2 wells sampled
2019							
OBJ-set wells sampled per trip	1	2	3	4			
Number of trips	181	76	15	1		273	94.10%
2018							
OBJ-set wells sampled per trip	1	2	3	5			
Number of trips	212	58	13	1		284	95.10%
2017							
OBJ-set wells sampled per trip	1	2	3	4	5		
Number of trips	179	95	23	6	2	305	89.80%
2016							
OBJ-set wells sampled per trip	1	2	3	4			
Number of trips	184	92	24	8		308	89.60%
2015							
OBJ-set wells sampled per trip	1	2	3	4			
Number of trips	217	68	11	2		298	95.60%
2014							
OBJ-set wells sampled per trip	1	2	3	4			
Number of trips	182	71	9	1		263	96.20%
2013							
OBJ-set wells sampled per trip	1	2	3	4			
Number of trips	170	59	5	1		235	97.40%
2012							
OBJ-set wells sampled per trip	1	2	3	7			
Number of trips	161	64	11	1		237	94.90%
2011							
OBJ-set wells sampled per trip	1	2	3	4			
Number of trips	155	48	6	1		210	96.70%
2010							
OBJ-set wells sampled per trip	1	2	3	4			
Number of trips	127	42	9	3		181	93.40%

Shark sampling program in Central America

- We need to improve our ability to assess and manage sharks in the EPO
  - Silky, hammerhead

- SAC-14-INF-L showed that data on artisanal shark fishing in the EPO is critical to achieving this goal

- Sustaining a reliable and accurate data collection program for these fisheries depends on the participation and support of member countries

- We propose a collaborative project in Central America focused on co-developing skills and methods for long-term monitoring of artisanal shark fishing

  - Implementing sampling protocols developed ~~in~~ by the IATTC scientific staff in collaboration with CPCs
  - Expanding biological data collection (morphometrics, genetic sampling)

  - Updating census data used for catch extrapolations

Shark sampling program in Central America

Country	Option 1 (Stock assessment)			Option 2 (Focus sampling effort in those sites that contributed more than 10% of the total catch on the country)		
	Total landing sites	Total sampling technicians	Total cost (USD$)	Main landing sites only	Sampling technician in main landing sites	Total cost (USD$)
CRI	2	3	$79,200	2	4	$79,200
SLV	12	24	$488,600	2	4	$79,200
GTM	22	44	$1,054,500	2	4	$79,200
NIC	8	16	$330,200	2	4	$79,200
PAN	25	50	$1,041,000	2	4	$79,200
Total	**69**	**137**	**$2,993,500**	**10**	**20**	**$396,000**

Other data required: -Census (Catch and efforth update)	Other data required: -Census (Catch and efforth update)

Shark sampling program in Central America

Option 3					
Country	Census		Capacity building on sampling		Total cost Option 3 (USD$)
	Total sampling technicians	Total cost (USD$)	Total sampling technicians	Total cost (USD$)	
CRI	2	$ 40,800			**$ 40,800**
SLV	2	$ 40,800	2	$ 40,100	**$ 80,900**
GTM	2	$ 40,800	2	$ 40,100	**$ 80,900**
NIC	2	$ 40,800			**$ 40,800**
PAN	2	$ 40,800	2	$ 40,100	**$ 80,900**
Data editor	2	$ 28,800			**$ 28,800**
Total	12	$ 232,800	6	$ 120,300	**$ 353,100**